NOVEMBER 28, 1936

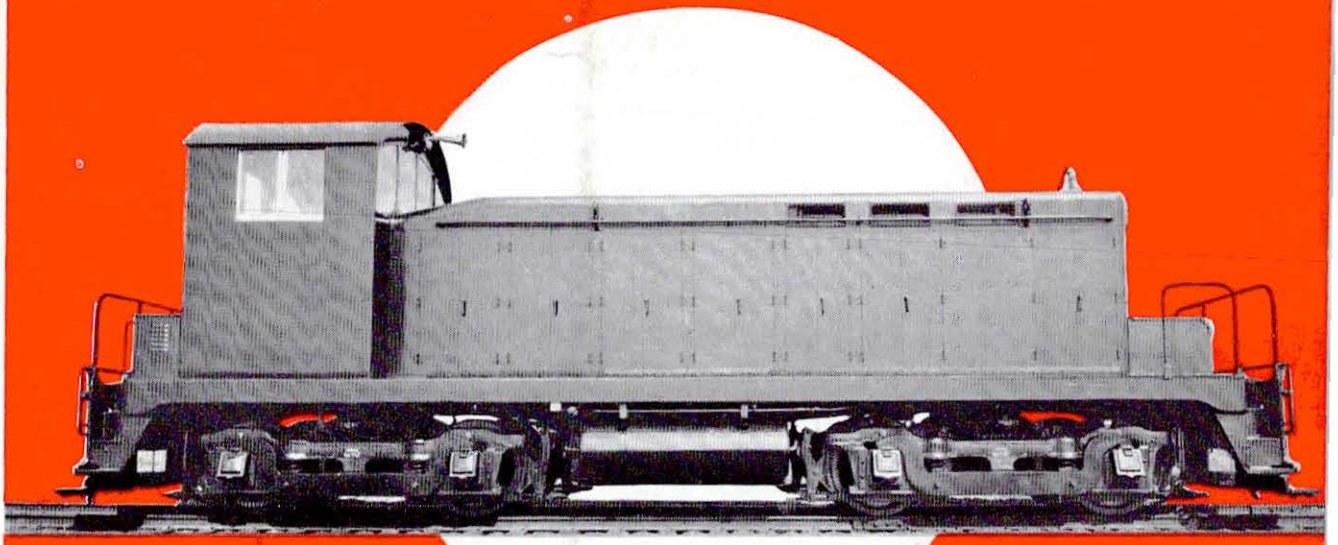
Railway Age

Founded in 1856

McCARTNEY LIBRARY
GENEVA COLLEGE

MAXIMUM AVAILABILITY AND FLEXIBILITY WINTER OR SUMMER • HIGH FUEL ECONOMY • LOW MAINTENANCE COST

June efficiency in January with EMC Diesel Switchers



Avoid these Winter Problems:

"Freeze-ups" with resultant effect on operating economy, performance and availability • Loss in Tractive Effort • Increased fuel consumption • Impairment of safety due to smoke and steam • EMC Diesel Switchers are available in 100-ton, 600 H. P. and 125-ton, 900 H. P.

ELECTRO-MOTIVE CORPORATION
SUBSIDIARY OF GENERAL MOTORS
LA GRANGE, ILLINOIS, U.S.A.

E-M

EMC DIESEL POWER

Air-conditioning should mean...

TO COST SHEETS AS WELL AS PASSENGERS

NO investment can be profitable if it costs as much as it produces. It is already known that air-conditioning builds passenger revenue . . . it is fast becoming known, too, that its cost is a factor that can vary tremendously.

Knowing this . . . and knowing that the storage batteries used have an important bearing on both efficiency and cost, railways in all parts of the country have found the solution in Exide-Ironclad Batteries.

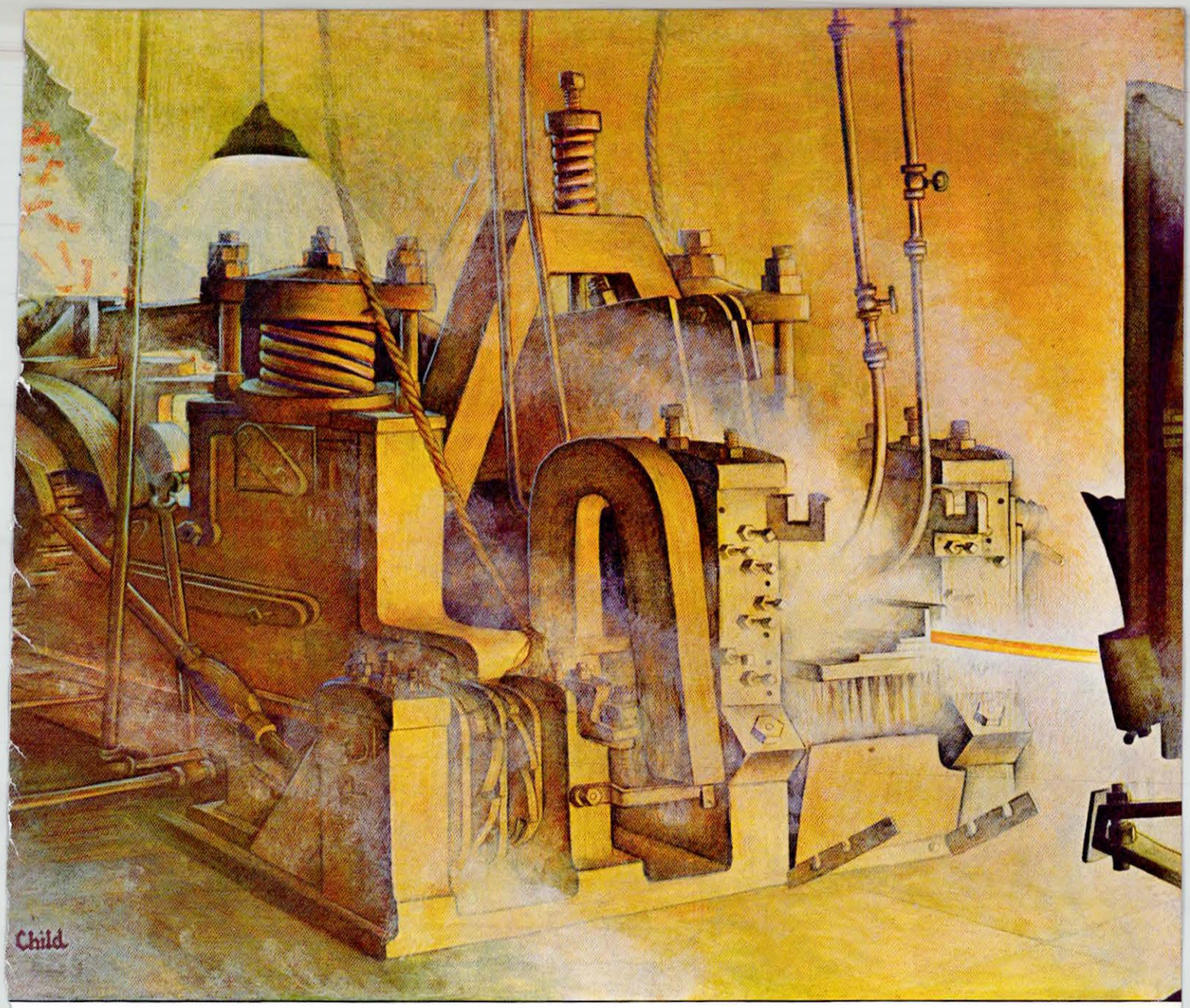
Exide-Ironclad Batteries cut air-conditioning costs because . . . (1) they require a minimum of maintenance . . . (2) they give a long life of trouble-free service because they're ruggedly built . . . (3) their high electrical efficiency assures a maximum of useful work from the current charged into them . . . (4) they are especially designed to carry the prolonged heavy loads imposed by air-conditioning's peculiar demands.

High efficiency at low cost . . . that is why your air-conditioning service should be built around Exide-Ironclad Batteries.

Exide
IRONCLAD
BATTERIES
With Exide **MIPOR** Separators
"MIPOR," Reg. U. S. Pat. Off.

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia
The World's Largest Manufacturers of Storage Batteries for Every Purpose
Exide Batteries of Canada, Limited, Toronto

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933, at the Post Office at Philadelphia, Pa., under the Act of March 3, 1879.



Machine for hot-forging track spikes in Bethlehem's Lebanon, Pa. Plant

Always seeking the best process

THROUGH the entire range of steel products manufactured by Bethlehem no stone is left unturned to give them properties making them definitely superior in their respective fields.

An excellent illustration of this policy is found in the manufacture of track spikes. These are among the simplest of finished steel products, ordinarily considered as calling for but little refinement in manufacture, but Bethlehem makes them by hot-forging—fundamentally the same process used to make vital parts of automobiles, locomotives and other machines where the highest degree of ruggedness is required.

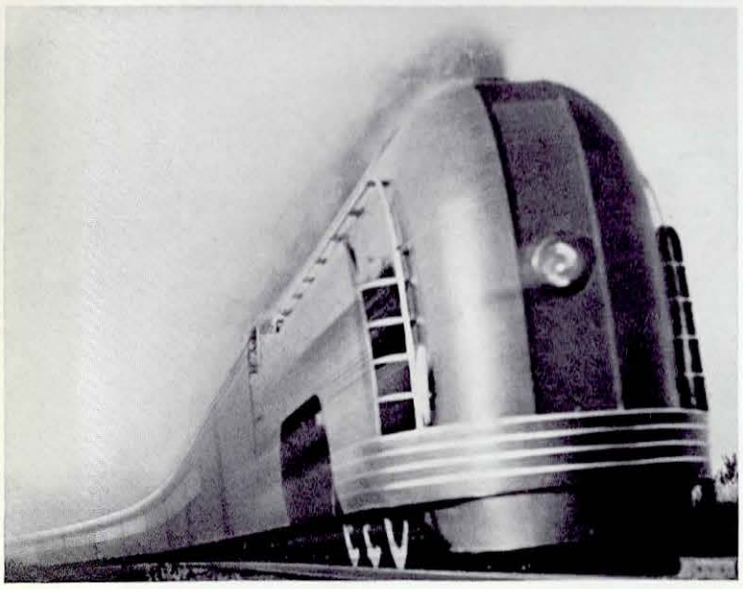
Made in this way, each spike is an individual forging—tough, sinewy, close-knit, free from internal strains and with a corrosion-resistant surface that affords an excellent grip for the wood. These qualities definitely reduce maintenance costs on track.

This attention to small details affecting serviceability, handling or fabricating is characteristic of all Bethlehem products from bethanized wire, zinc-coated by a special electrical process, giving a vastly more durable coating, to controlled-cooled rails, processed in a way that eliminates transverse fissures.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

Steel Products for Today's Railway Needs



CONTROLLED-COOLED RAILS

BETHLEHEM is now producing rails by the Controlled-Cooling Process which has been developed to eliminate transverse fissures.

The Controlled-Cooling Process utilizes the discovery that transverse fissures are caused by shatter cracks which are sometimes found in rails cooled on the hot-beds in the ordinary way. This is now remedied by taking rails from the hot-beds at an elevated temperature and reducing their temperature gradually.

TRACK BOLTS AND SPIKES

BETHLEHEM makes bolts, nuts and related products for every railway requirement. Hot-forged nuts, track bolts, frog bolts, engine bolts, staybolts and superheater bolts. Corrosion-resisting bolts, track spikes, turnbuckles, and many special items.

HEADS AND OTHER FLANGED PRODUCTS

LET Bethlehem supply your needs in the line of tank heads, boiler heads, dome sheets, manheads, yokes, saddles, and miscellaneous flanged plate work.

The location of the Bethlehem Flanging Shop, with the plate mills and open-hearth furnaces of a large steel mill right at hand, makes it possible to fill large or small orders in any grade of steel with great speed.

WROUGHT-STEEL WHEELS

THE forging and rolling processes of manufacture give these wheels abundant strength and stamina for today's higher speeds. They can be furnished in the heat-treated condition.

TRACK SPECIALTIES

FROGS and Switches, Switch Stands, Guard Rails, Gage Rods, Rail Anchors, and related equipment. Special Track Layouts.

CARBON-STEEL BARS

IN making carbon-steel bars Bethlehem pays special attention to the properties that make for high machinability, response to heat-treatment, and complete reliability.

PLATES — CARBON OR ALLOY STEEL

BETHLEHEM'S plate-making skill has shown up particularly in the manufacture of nickel-steel boiler and fire-box plates to meet the exacting requirements of the service in respect to both fabricating qualities and serviceability.

A FULL RANGE OF STRUCTURAL SHAPES

BETHLEHEM Steel Company mills roll structural shapes for all the many uses in railway structures and equipment.

Bethlehem's complete range of structural shapes extends from 36-in. I-beams for single-span bridges down to the smallest angles.

ALLOY STEELS

MAYARI Engine-Bolt Steel, Mayari Staybolt Steel, Silico-Manganese Spring Steel, Mayari Superheater-Bolt Steel. Alloy-Steel forging billets for heavy forgings.

BUILDINGS

STEEL-frame buildings of all descriptions.

BRIDGES OF ALL TYPES

WEATHER-RESISTING SHEETS

BETH-CU-LOY Sheets are made of copper-bearing steel, the material which impartial tests have shown outlasts by two to two and one-half times steel made without the copper.

BOILER TUBES

GENUINE old-fashioned charcoal-iron boiler tubes; double-pass steel tubes. Double-pass copper-bearing steel tubes.

Other Bethlehem Products for Railways

RAILS and Accessories, Steel Freight and Passenger Cars, Tool Steels, Alloy Steels, Forged-Steel Axles, Steel H-Piling, Steel Pipe, Castings, Forgings, Wire and Wire Products, including Bethanized Fence for extra-long life in corrosive atmospheres.

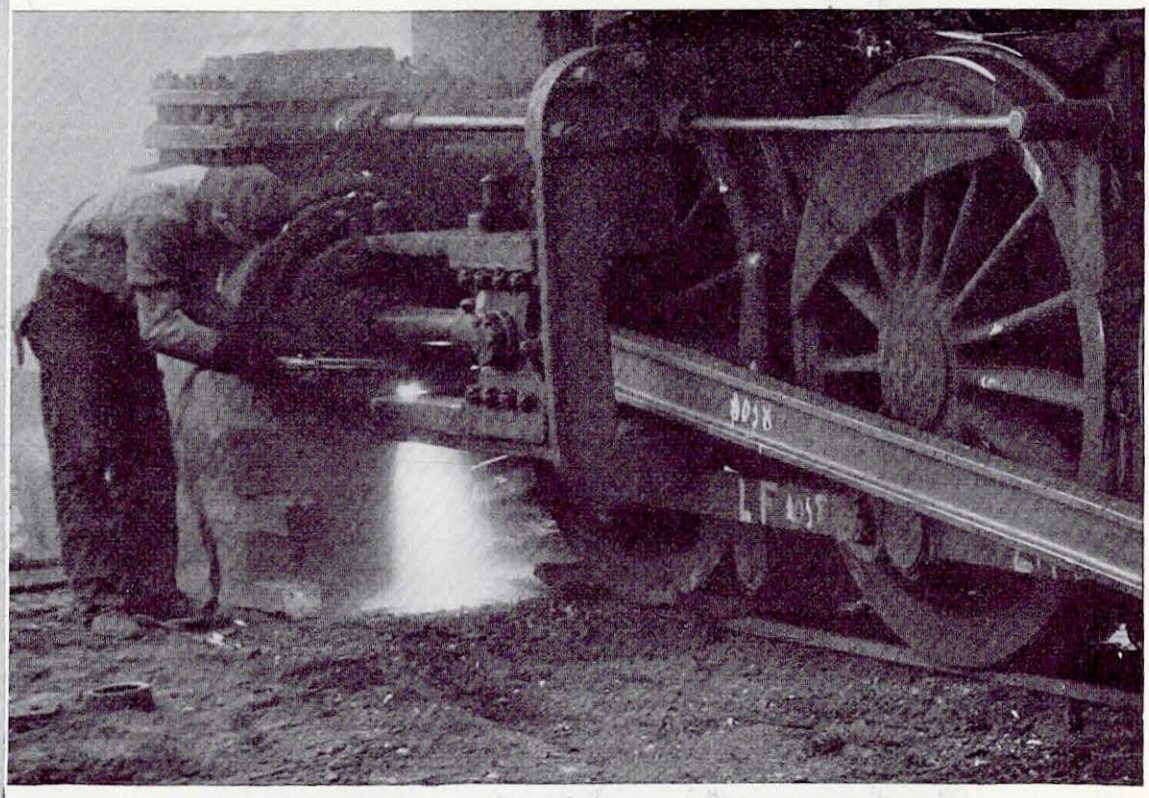
BETHLEHEM STEEL COMPANY, *General Offices:* Bethlehem, Pa. *District Offices:* Albany, Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Hartford, Honolulu, Houston, Indianapolis, Kansas City, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Portland, Ore., Salt Lake City, San Antonio, San Francisco, St. Louis, St. Paul, Seattle, Syracuse, Washington, Wilkes-Barre, York. *Export Distributor:* Bethlehem Steel Export Corporation, New York.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

There's MONEY

in *scrapping* old locomotives!



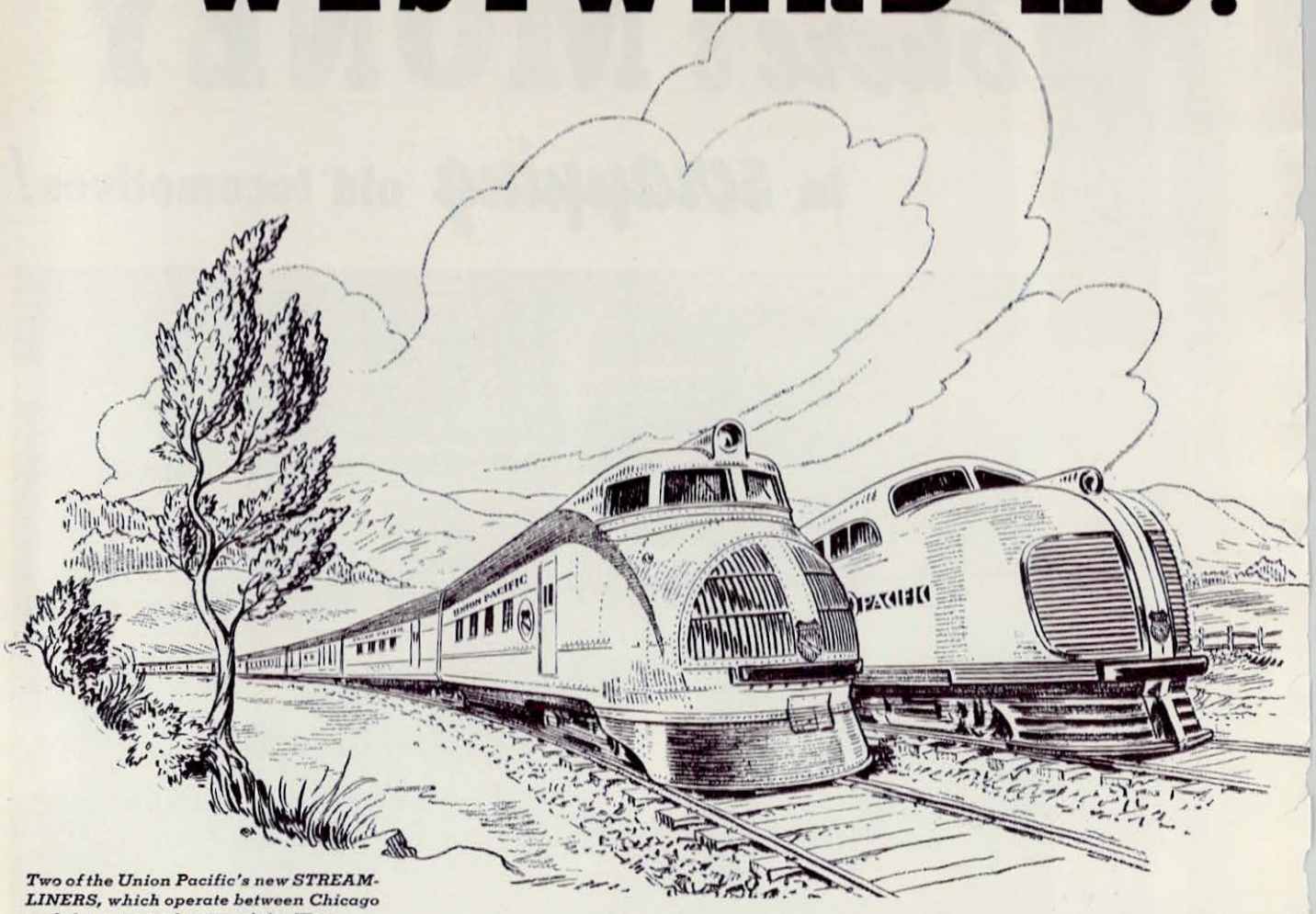
Are you getting your share?

You can turn obsolete locomotives and rolling stock into cash at the greatest profit by oxyacetylene cutting. An active market exists for scrap steel, and, in addition, many costly parts can be salvaged.

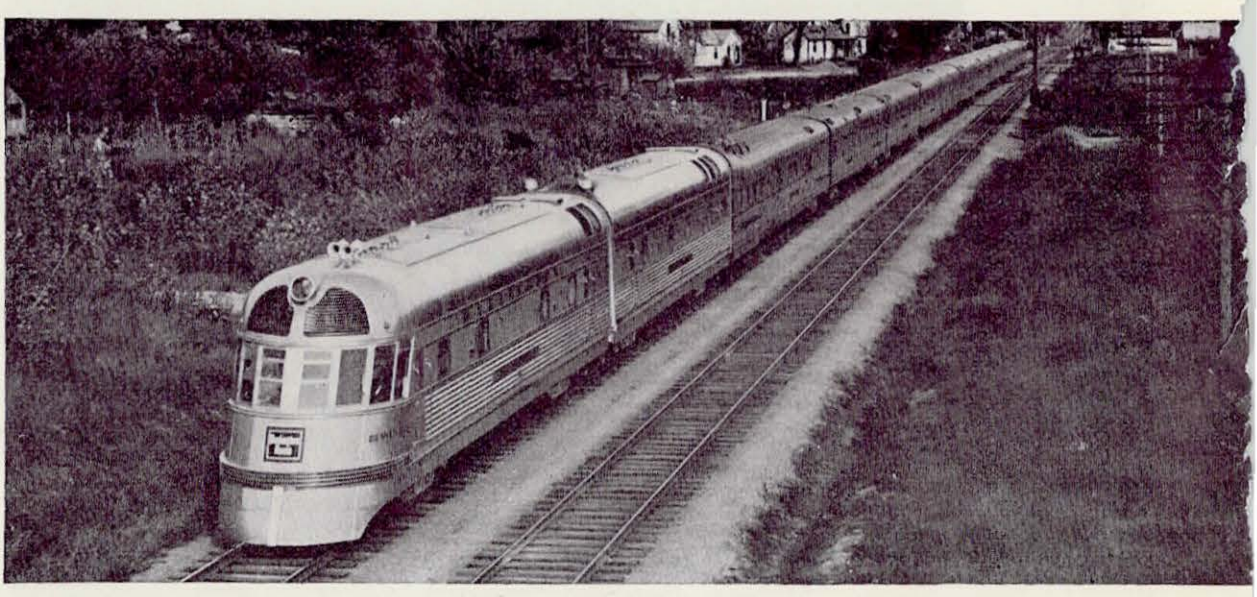
The use of clean-cutting, economical equipment assures you of getting the most from your scrap cutting. Airco Railroad Customers have reduced their scrapping costs to a minimum thru the combination of Airco Oxygen and Acetylene, Airco-DB Apparatus, and Engineering Assistance. Our engineers would be glad to discuss your scrapping problems with you and furnish you with detailed cost data.

AIR REDUCTION
SALES COMPANY
General Office: 60 East 42nd Street, New York, N. Y.
DISTRICT OFFICES IN PRINCIPAL CITIES

WESTWARD HO!



Two of the Union Pacific's new STREAMLINERS, which operate between Chicago and the principal cities of the West



The DENVER ZEPHYR, newest of the Burlington's ZEPHYR fleet

G E N E R A L

Speeding Diesel-Electrics Attract More Passengers —Earn More Revenue

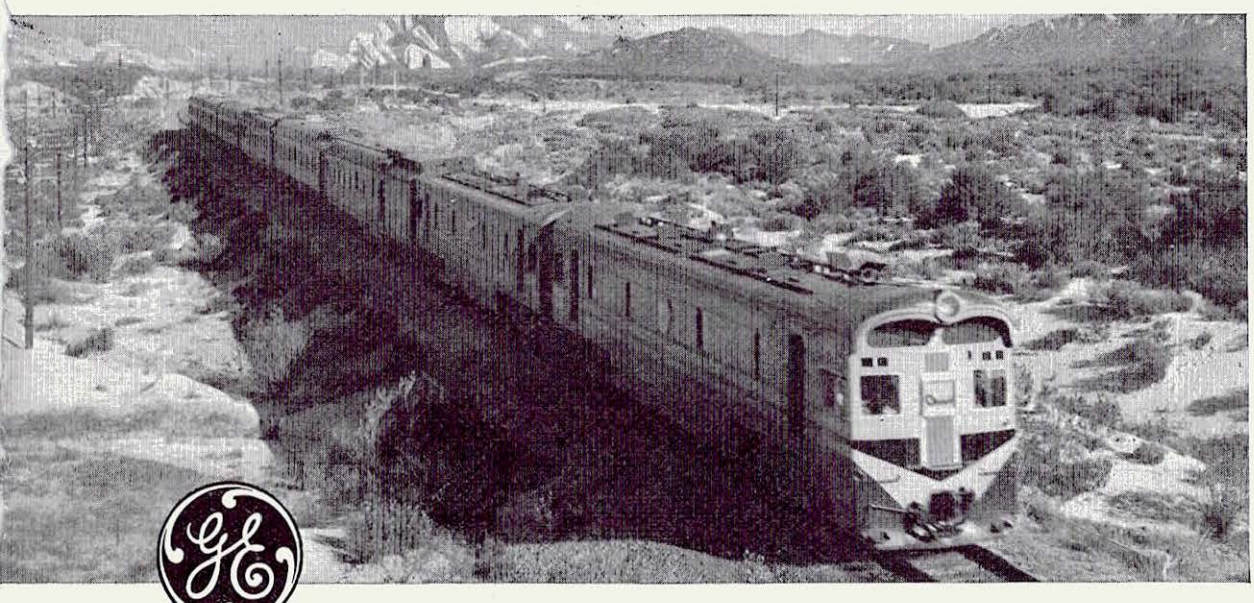
PIONEERS in new transportation—bringing the frontiers closer together—linking the Far West with the cities of the East. Fast, diesel-electric trains cut many hours from the time previously required between Chicago and the West. Air-conditioned cleanliness and the comfort of smooth sailing bring new passenger traffic—and more profits.

Speeding along at an average of nearly a mile a minute, rolling up to nearly a hundred miles an hour in stretches, the lightweight, diesel-electrics are modern in every detail. Small wonder that passengers are attracted to their time-saving and luxury!

Why do progressive railroads choose diesel-electric motive power? Because the records of everyone of the new streamlined, lightweight, diesel-electric trains show that passenger traffic is increased. And this extra business has meant a splendid return on the investments.

Increased passenger traffic alone does not constitute the profit-making features of diesel-electrics. These power units are setting amazing mileage records. Each is taking the place of several standard locomotives because they do more work—stay in service day after day. In addition, fuel costs are 50 per cent lower, and decreased maintenance costs mean additional savings.

Electric drive is the ONLY practical method by which the power of giant diesel engines can be transmitted smoothly to the wheels. The public wants this kind of transportation and has proved it—these ultramodern trains are revenue-getters and they have proved it. When will your road join the parade of the streamlined trains? General Electric, Schenectady, N. Y.



The SUPER CHIEF, transcontinental flyer of the Santa Fe, is pulled by a 3600-hp twin-unit, diesel-electric locomotive

250-21

GE ELECTRIC

ON any modernization program, full return for every dollar of the appropriation can be insured with AmCreCo products which offer —at low cost—durability, strength, adaptability and low maintenance cost. Many years of service on scores of railways have established, beyond question, the advantages of AmCreCo poles, ties, piles and timbers in construction and maintenance work.

AMERICAN CREOSOTING COMPANY

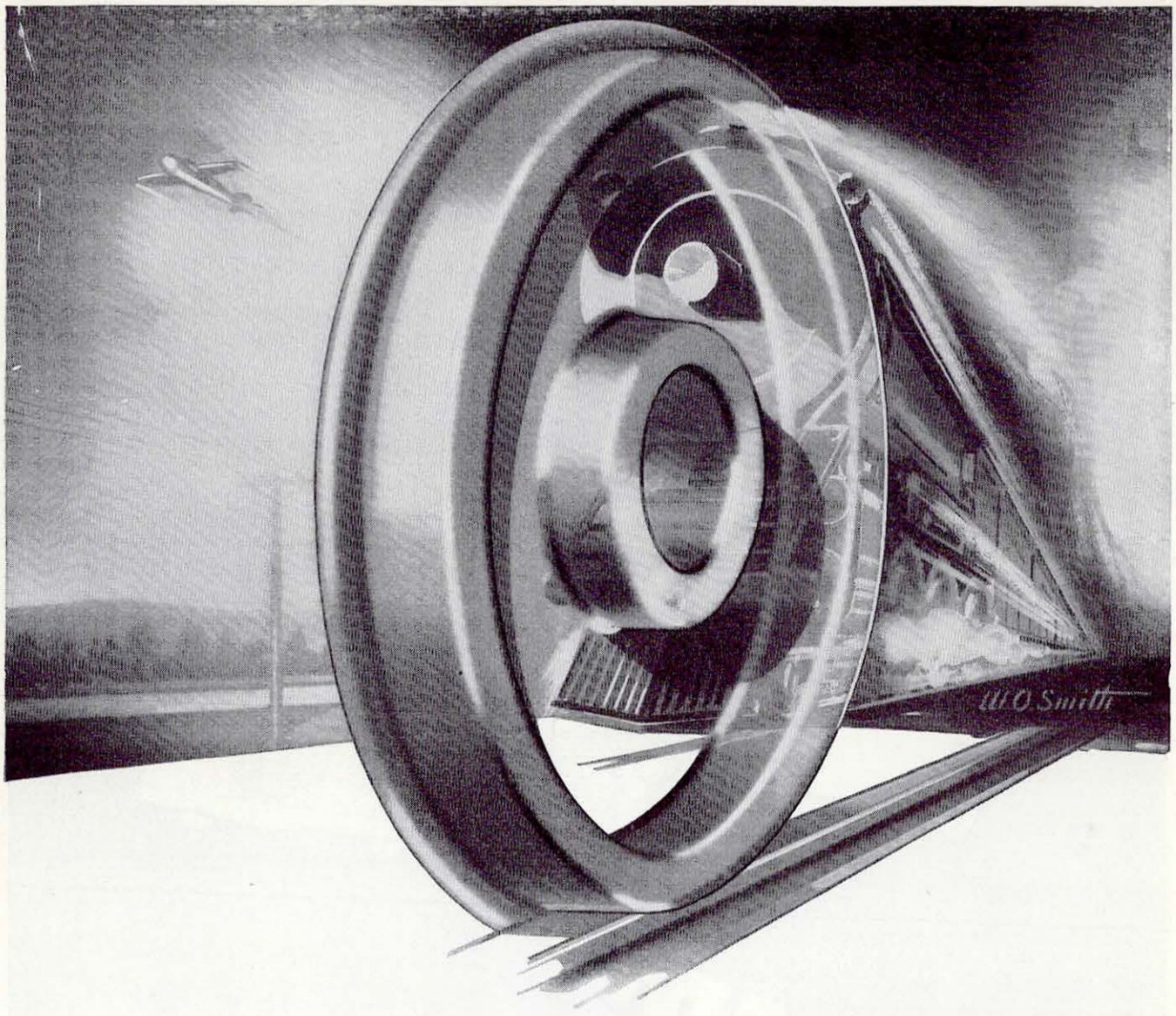
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED

AMCRECO LOWRY PROCESS CREOSOTED WOOD

GEORGIA CREOSOTING COMPANY INCORPORATED

ADDRESS INQUIRIES TO CHICAGO, ILL., OR LOUISVILLE, KY.



A MIGHTY WHEEL

when it comes to long safe mileage

Delivering plus-mileage day after day over long, hard runs is a task well suited to ARMCO HEAT-TREATED WHEELS. They have what it takes, especially for engine truck and tender service—sound, wrought steel rendered tough, hard and uniform by scientific heat treatment. This explains the extraordinary safety that accompanies their use . . . the long wear and extra mileage that contributes to profits . . . and the dependability that's best expressed by saying every ARMCO Heat-Treated Wheel is just like the next. All of which suggests you could well put your wheel requirements up to ARMCO, whether you need Heat-Treated Wheels, One-Wears, Two-Wears or Multiple-Wears. You can reach us quickly at the nearest address below.

ARMCO RAILROAD SALES CO.
Subsidiary of The American Rolling Mill Company
EXECUTIVE OFFICES: MIDDLETOWN, OHIO
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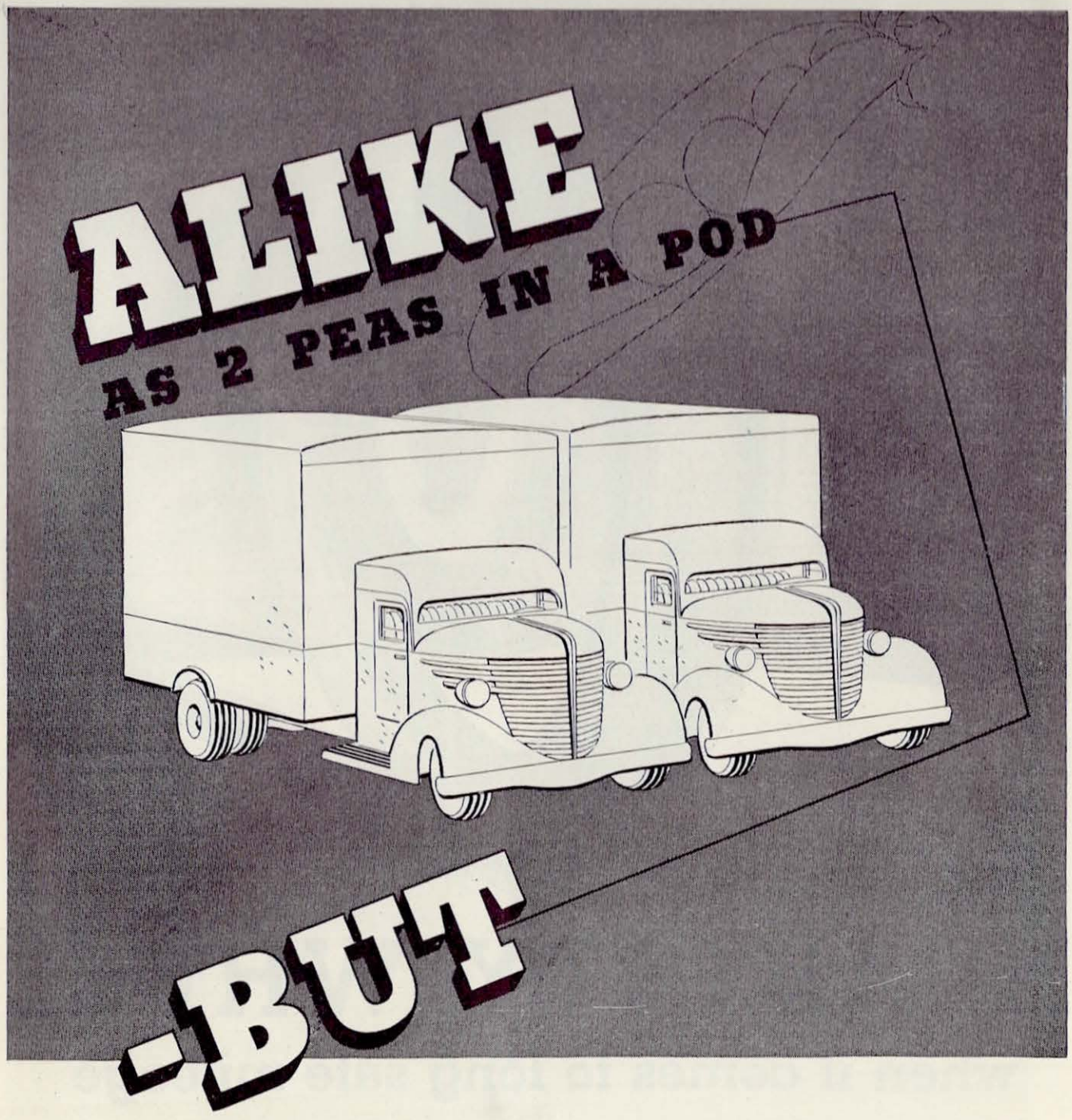
ARMCO WROUGHT STEEL WHEELS



Identical, yes . . . But don't be misled by outward appearance or count too heavily upon mechanical characteristics from the standpoint of speed and power without carefully considering proper control • Remember, above all, that speed and power lacking proper control is worse than wasted in the modern scheme of commercial transportation • Consider also that the difference between the two vehicles illustrated is genuine Westinghouse Air Brakes which, so long as success in transportation is measured in hard, cold figures of dollars and cents, constitutes a difference as pronounced as day and night • Get the comparative facts on genuine Westinghouse Air Control by writing the manufacturer or, better still, ask any of the thousands of highly successful operators who have made direct comparisons with this modern control against ordinary brakes on identical vehicles, on identical runs, under identical conditions • The results universally favor genuine Westinghouse Air Brakes and by an exceptionally wide margin • Write today for further information.

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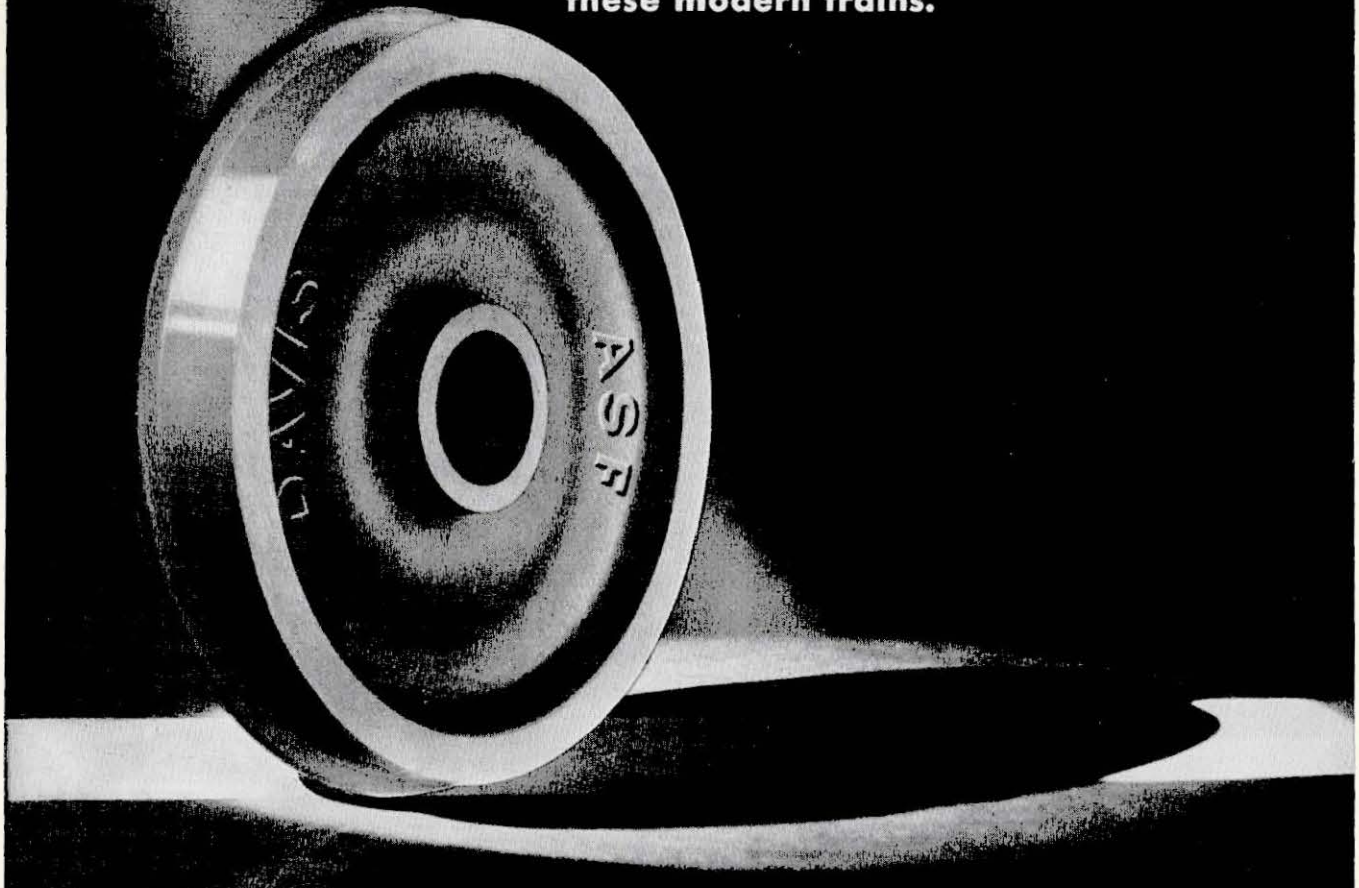
Bendix-Westinghouse Automotive Air Brake Co.
Pittsburgh, Pennsylvania

Genuine
WESTINGHOUSE AIR BRAKES
AS LOW AS $139.00 INSTALLED

DAVIS
HEAVY SERVICE STEEL WHEEL

The wheel selected for use under the tenders of the locomotives that pull the high speed "C. & N. W. 400" and the Milwaukee "Hiawatha."

These wheels in no small measure contribute to the dependability of these modern trains.



AMERICAN STEEL FOUNDRIES

NEW YORK CHICAGO ST. LOUIS

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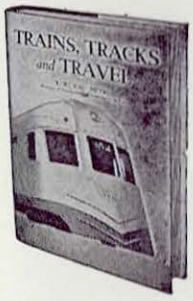
New Fourth Edition

Trains, Tracks and Travel

By T. W. VAN METRE

Professor of Transportation, Columbia University



The new edition of this popular book on railroads describes latest practice. There is a complete new chapter on streamlined trains and additions to others covering the new developments in air brakes, air conditioning of passenger cars and in high-speed Diesel and electric locomotives. Among the numerous new illustrations are shown the new streamlined trains. This is an excellent book for a boy who wants to know more about railroads and for the average reader.

Contents

Our Steam Railroads—The Railroad Track—The Steam Locomotive—Electric Locomotives; Gasoline and Oil Motors—Freight Cars—Passenger Train Cars—Tomorrow's Trains Become Today's—Passenger Stations and Terminals—The Operation of Trains.

1936. 4th. 312 pages, 276 illus., 7 x 9½ in., cloth. $3.00

Analysis of Railroad Operations

By J. L. WHITE

Formerly Assistant Comptroller, United States Railroad Administration; Director, Section of Transportation Service—Federal Co-ordinator of Transportation

Without going into the details of accounting procedure, Mr. White clearly explains the accepted method of analyzing and interpreting railroad statistical data. He describes how the figures produced in accounting departments should be used in the study of railroad operating results; how these figures reflect the various activities of the railroad and its efficient or inefficient operation as a whole or in any of its departments.

Classifications of the Interstate Commerce Commission are shown in full and frequent references are made to them in the main text.

1925. 391 pages, forms, index, work sheet, and the Jan. 1, 1935, order of the I. C. C., 6 x 9 inches, cloth. $4.00

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( ) United States Safety Appliances
( ) When Railroads Were New
( ) Transportation Glossary

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Company .....

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(This offer is limited to the United States and Canada) R.A. 11-28-36

United States Safety Appliances

(A. A. R. Edition)

The 14th edition of this book contains all the new laws, I. C. C. rulings and A. A. R. specifications since the last edition in 1928. More than 250,000 of these books have been sold.

1935. 121 pages, 49 drawings, 7½ x 3¾, imitation leather, $1.00

When Railroads Were New

By CHARLES FREDERICK CARTER

A fascinating human interest story of the early American and Canadian railroads and of the men who built and ran them. The author, an old railroad man, tells of the beginnings of the Erie, the Pennsylvania, the Baltimore and Ohio, the New York Central, the first Pacific railroad, the Santa Fe, the Rio Grande, the Canadian Pacific and other lines. It is illustrated with reproduction of wood cuts of early locomotives and railroad scenes.

1926. 4th (Centenary). 338 pages, 17 illustrations, 6 x 9 inches, cloth. $2.50

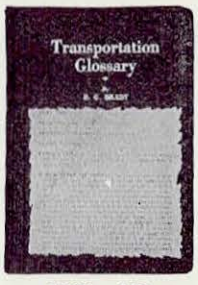
Who's Who in Railroading

The 9th Edition of what was formerly the "Biographical Directory of Railway Officials of America" is based upon a complete resurvey of the field by means of original questionnaires. Biographical sketches of some 4,000 railroad officials, equipment manufacturers, economists, members of regulatory commissions and others whose work is directly connected with the railroad industry of North America are presented. The descriptions of these leaders of the rail industry include personal information, such as their family connections and social, religious and political affiliations, as well as a complete outline of their professional careers.

1930. 579 pages, 6 x 9 x 1⅝ inches, cloth. $3.00

Transportation Glossary

By H. G. BRADY



Technical and semi-technical terms, phrases and expressions in more common use in railway, highway, air and marine transportation, and in port traffic are concisely defined in this handy reference book. Ordinary dictionaries, thesauri and law book sources furnish little information on transportation terms and this book fills a long felt need. It is printed in large clear type and cross references facilitate quick tracing of desired information.

1929. 119 pages, 5 x 7 inches, flexible. $1.75

BROKEN RECORDS!

The fact that Budd-built trains have broken most existing speed records—both for short and long distances—is impressive. But even more significant are the reasons that lie behind this ability.

- **FIRST: Budd-built trains are *truly light weight*. They weigh only half as much as comparable standard equipment. Light trains can be pulled with less motive power than is required for heavier trains. Their entire operation is more economical.**

- **SECOND: Because these trains exceed all standard requirements for strength, they can be pulled at exceptionally high speeds *with perfect safety*. They are built of stainless steel, which has four times the elastic strength of ordinary steel. This metal, when welded by the Budd "Shotweld" process, is undoubtedly the most practical and efficient of all modern alloys for strong, safe construction.**

- **THIRD: Budd-built trains are designed to have a low center of gravity. This eliminates side motion and insures smooth and quiet performance at high speeds, especially on curves. They provide the *utmost in comfort* at all speeds.**

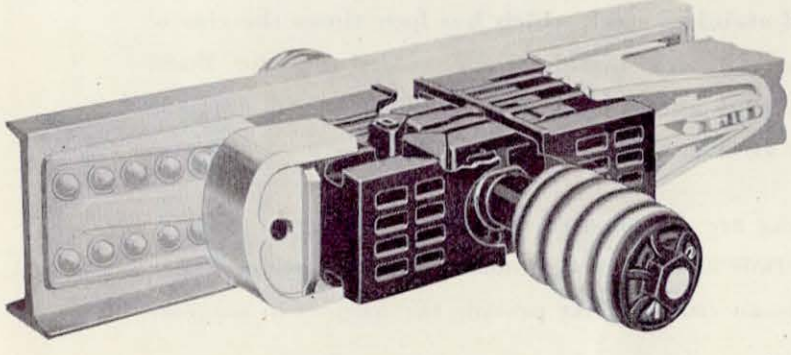
But the Budd System of Light-Weight Construction is the basic reason for the success of these trains, both in their high speed performances and—of far greater importance—in their ability to increase revenues.

EDW. G. BUDD MANUFACTURING COMPANY

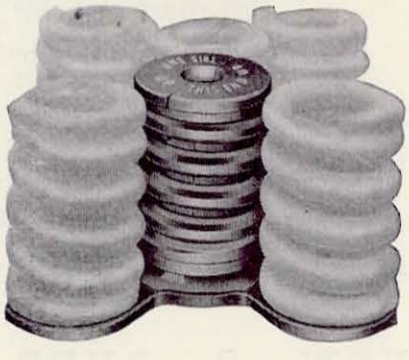
RAILWAY DIVISION, PHILADELPHIA

BUDD METHODS SAFELY ELIMINATE DEAD-WEIGHT

CARDWELL FRICTION
BOLSTER SPRING



CARDWELL FRICTION
DRAFT GEAR
Type L-25 SA



CARDWELL FRICTION
BOLSTER SPRING
as Applied in 6-Spring Nest
of 50-Ton Double-Truss
Truck

CARDWELL WESTINGHOUSE CO., CHICAGO

CANADIAN CARDWELL CO., LTD., MONTREAL

ECONOMIC ADVANTAGES OF THE Chilled Car Wheel

AMCCW

1 — LOW INITIAL COST

2 — SUBSEQUENT EXCHANGE PRIVILEGE

by which all railroads return worn out wheels to the manufacturer in exchange for new wheels—the only cost being a conversion charge.

3 — SERVICE

with 39 foundries in the East, Middle West and Southwest, and 5 foundries in the West so conveniently located as to insure short haul, prompt delivery and minimum storage stock.

4 — ULTIMATE ECONOMY

based on average service under all types of freight equipment, the total final cost of chilled car wheels is far less than any other type.

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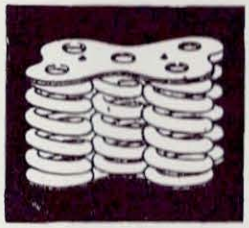
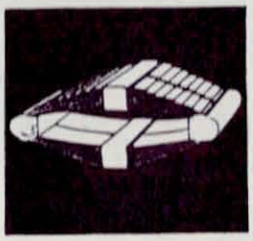
Members of this Association will be glad to give you complete information concerning Chilled Car Wheels.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS
445 N. Sacramento Blvd. CHICAGO, ILLINOIS

QUALITY SPRINGS

"RAILWAY" PRODUCTS



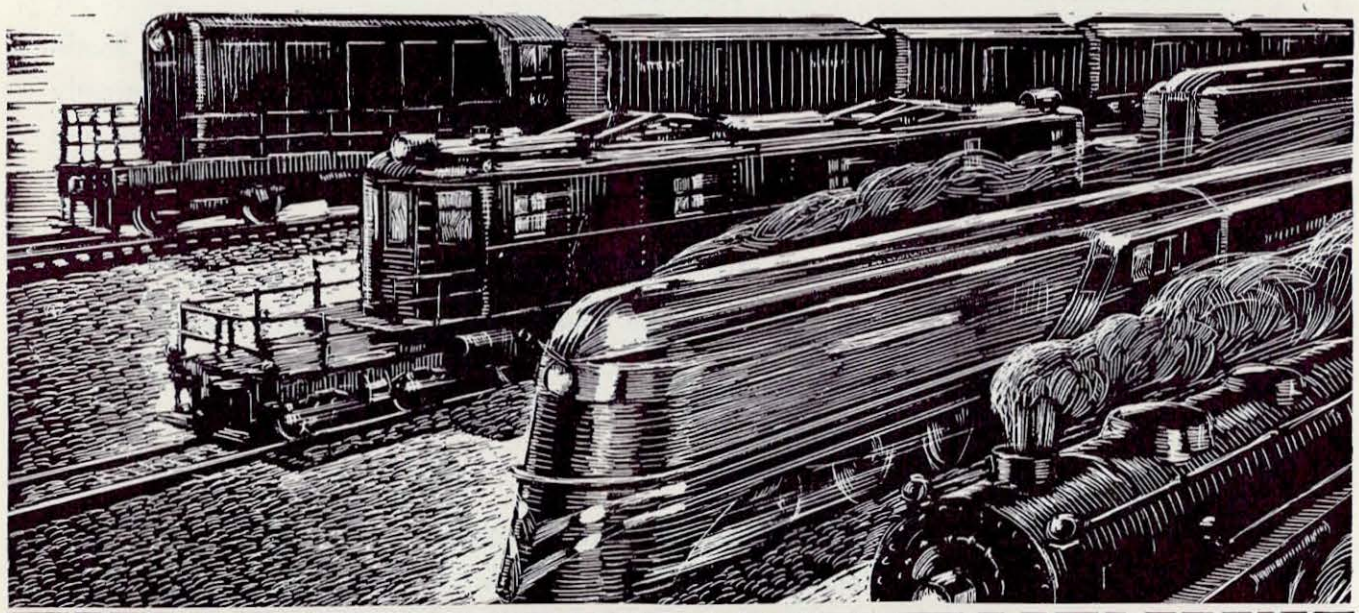


LOWER OPERATING COSTS

"RAILWAY" Quality Springs meet the more exacting present day requirements of higher train speeds—smoother riding equipment and the all time need for reduced operating costs.

On many occasions new or reconditioned equipment has presented unusual spring problems calling for comprehensive tests and a thorough knowledge of railroad requirements, only to be solved with unqualified success by "Railway" Spring experts. The thoroughly practical manner in which these spring problems have been mastered has demonstrated time and time again the economic value and need for this reliable source of spring supply.

The reliability and enduring service delivered by "Railway" locomotive and car springs are a vital factor in reduced maintenance expenses and maximum operating economies. It will pay to take advantage of this service.



AMERICAN LOCOMOTIVE COMPANY

RAILWAY STEEL SPRING DIVISION

30 CHURCH STREET · NEW YORK · N.Y.

Salvage

worn and broken equipment

by BRONZE-WELDING

Bronze-welding by the oxy-acetylene process has made possible the salvage of thousands of worn and broken iron and steel parts. In this manner parts requiring replacement are restored to serviceable condition quickly and at a fraction of the cost of new parts. Thus, expenditures for replacements are kept at a minimum and inventories of new parts can be reduced.

Oxweld Railroad Service, through its extensive laboratory research facilities, has developed high quality bronze welding rods for this application. Experienced Oxweld engineers and instructors provide training in the latest and best procedures for making economical, high quality welds.

Oxweld's many improvements in materials and procedures for the application of bronze-welding are typical of the benefits this railroad-minded organization has made available to American railroads. This is a further indication of Oxweld's continuous progress in servicing the welding and cutting requirements of a majority of the Class I railroads.

THE OXWELD RAILROAD SERVICE COMPANY

Unit of Union Carbide and Carbon Corporation

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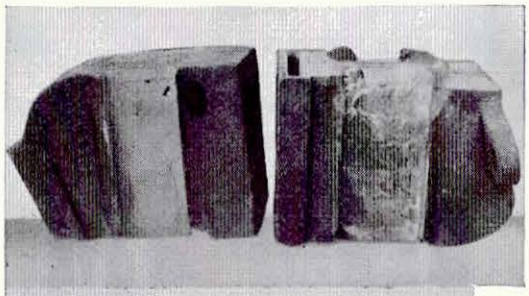
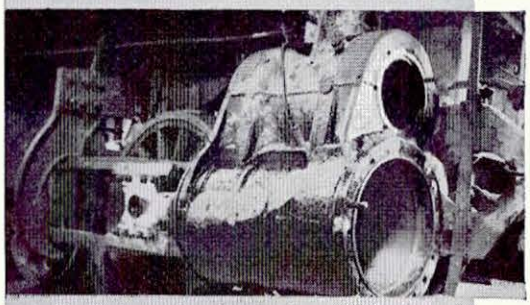
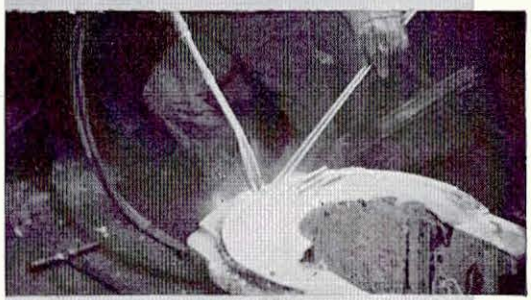
OXWELD RAILROAD SERVICE



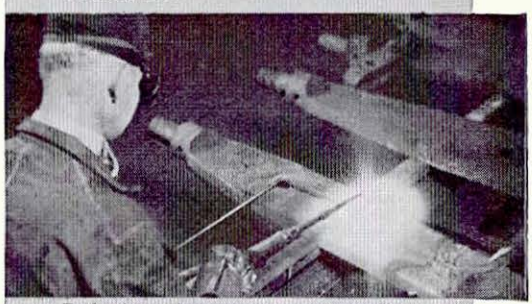
Worn [left] and rebuilt [right] journal boxes. When bronze-welded, they show little wear after many months of service.



Cracked cast iron locomotive cylinder is speedily repaired by bronze-welding to restore locomotive to service.



Worn locomotive hub liner is built up with Oxweld No. 25M Patented Bronze Welding Rod.



Brake beam hangers are economically rebuilt with Oxweld No. 25M Patented Bronze Welding Rod.

Connecting rods are regularly restored to service by bronze-welding.

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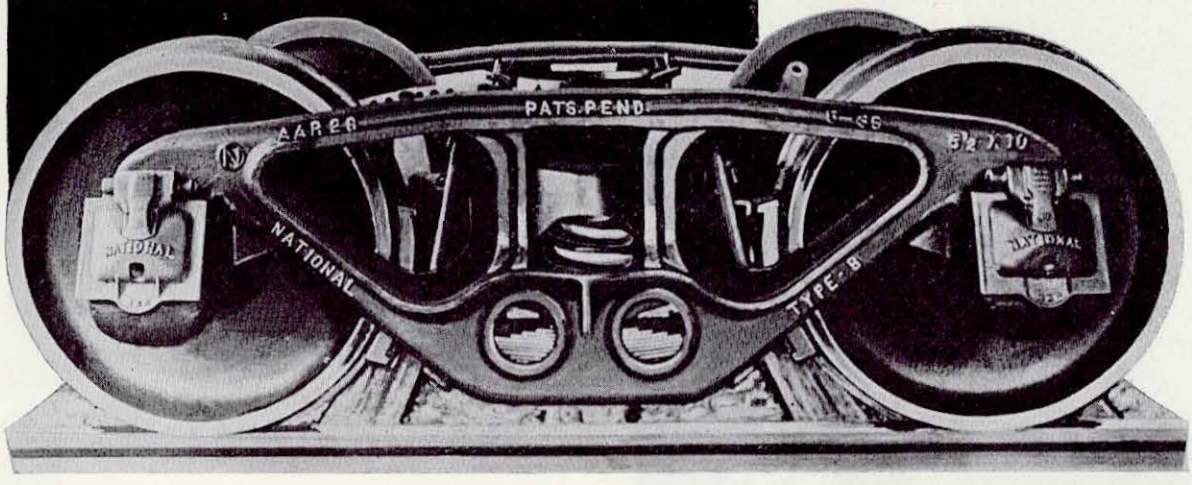

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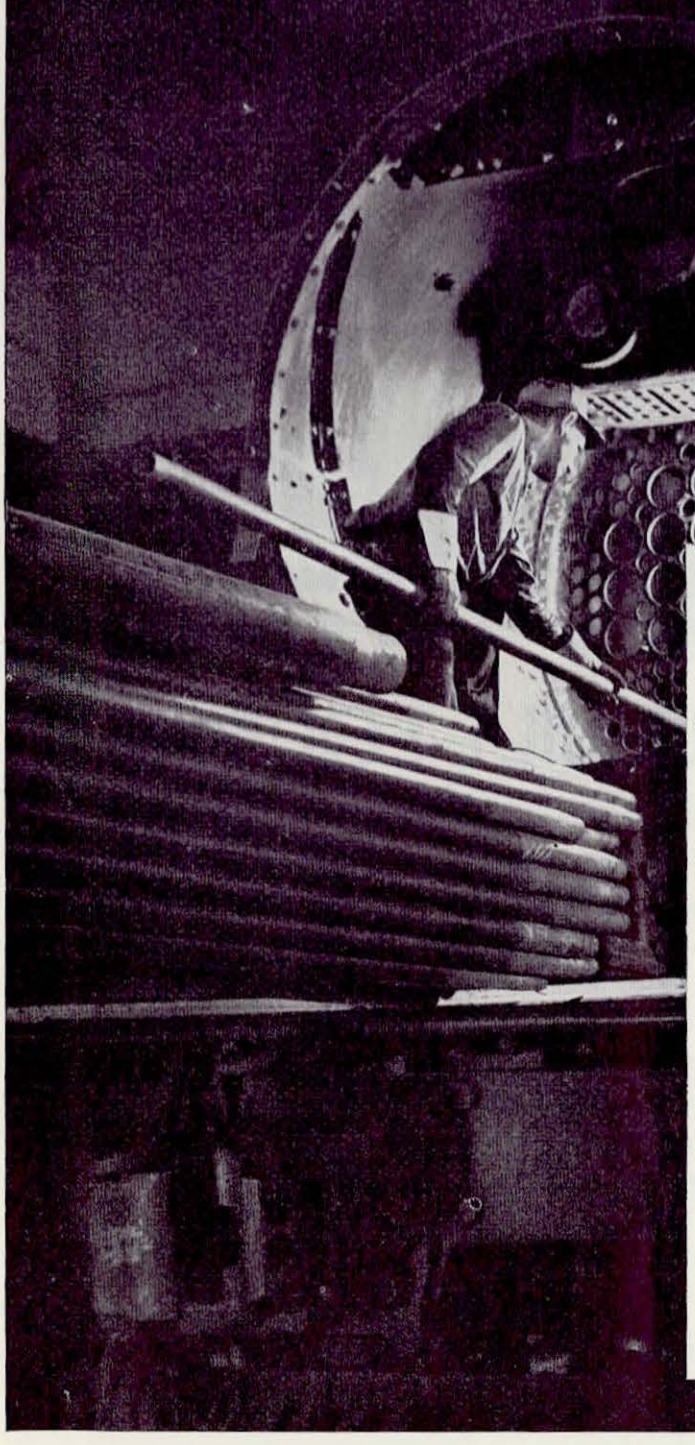

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G. N. Schramm, E. S. Taylerson and C. P. Larrabee find 80 per cent of the deterioration due to atmospheric corrosion, and describe the nature and effect of leachings from wet coal.

Railway Purchasing—A Problem in Co-operation **787**

U. K. Hall, general purchasing agent, Union Pacific System, presents a frank discussion of the relations of buyer, seller and consumer, outlining improper practices as he urges square dealing.

Railway Ownership of Motor Transport Companies **799**

A Motor Transport Section article reviewing the recent Interstate Commerce Commission report showing the extent of rail-highway co-ordination.

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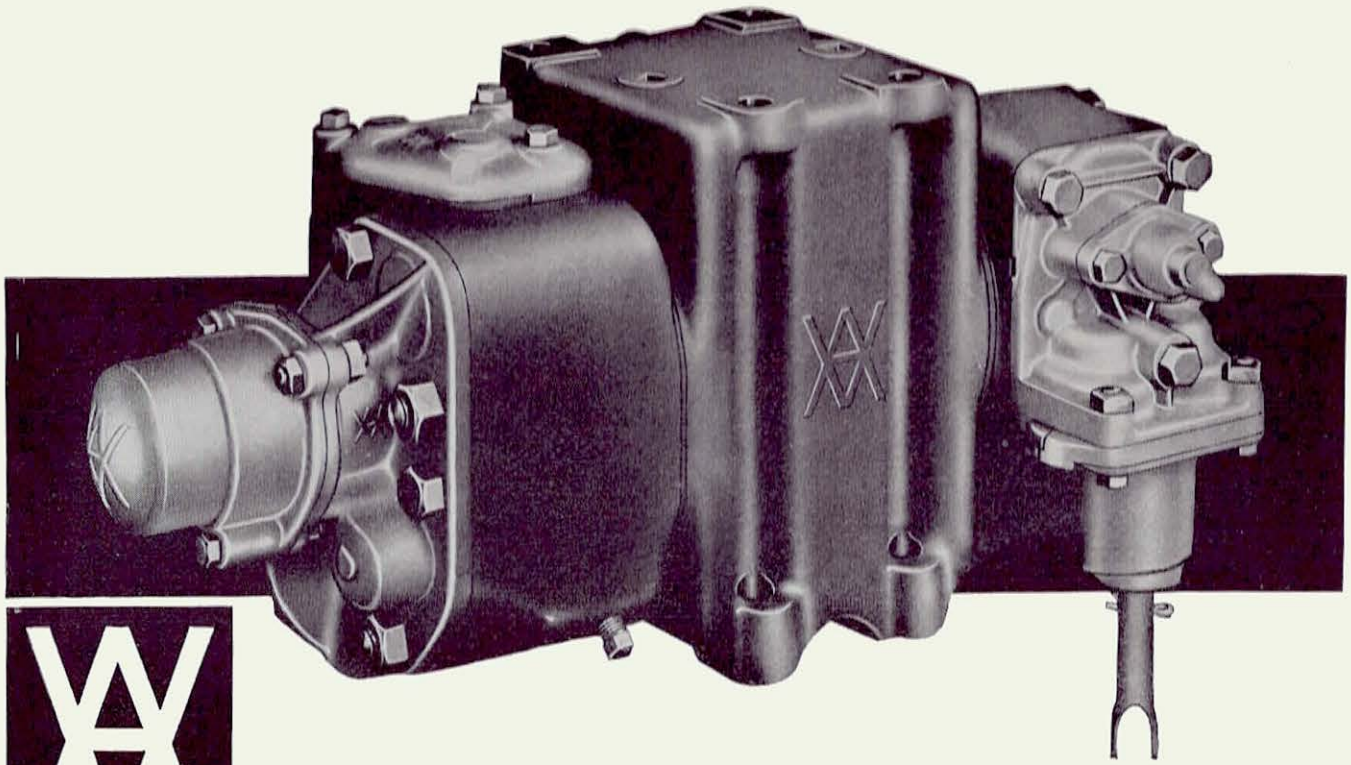

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(or even transportation) as a whole—their main function is rather to move traffic at the lowest available rates. If such men can take a viewpoint of sound economic statesmanship with regard to a question as fundamental as fourth section repeal, is it not possible that executives who direct business policy can likewise be aroused to the point where they will favor those policies which will assure the continuance of the railways in private ownership?

Business Still Has the "Gimmes"

The task will not be an easy one. Not all business men, by any means, are cured of the "gimmes," when the prospect of securing transportation partly at the cost of the taxpayers is concerned. Not all of them, by any means, are willing to make the concessions in their immediate self-interest necessary to prevent the first step being taken toward the general socialization of all large-scale industry. To enlist them, those who do understand the situation in its true significance will have to be bolder than they have been in the past. When business men in their short-sighted self-interest advocate methods and policies calculated to destroy private property in transportation, then business and industrial leaders who understand the issues at stake should not hesitate to denounce them and make clear to all the anti-social selfishness which is their motive. Business as a whole bears the blame for these seekers of subsidies and special privileges—and it will continue to bear that blame as long as it tolerates their activities in silence.

The choice is not a difficult one for any intelligent believer in the institution of private property—once he knows the facts. It is the duty of the railroad industry and those closely affiliated with it to see that every business man has these facts so that he may make his decision. What these facts are most readers of the *Railway Age* already know. They may be reviewed briefly as follows:

1. The railroad industry is and must continue to be the principal reliance of the people for the transportation of freight.

2. To maintain their plant, meet maturing obligations and keep in step with technical advance, the railways constantly need new capital.

3. New capital can be obtained from private sources only if earnings prospects are favorable; otherwise—since railway service must be continued—the only other alternative is to get the capital from the government, which in the end means government ownership.

4. The control of railway purchases by the government would immediately give political control over policies of manufacturers selling their products to the railways—preparing the way for making them unprofitable and eventually socializing them too.

5. Governments do not usually look with favor on competitors. Government-operated railways would probably bring socialization of other forms of transport as well (with political control of manufacturers supplying the equipment for other forms of transport).

6. The only way to prevent this first step in a chain of events in the direction of general industrial socialization is to restore railroad credit.

7. Credit restoration, of course, hinges on any steps which would give reasonable assurance of adequate railroad earnings and this assurance cannot be given failing a larger measure of competitive equality between the railroads and other forms of transportation. The steps necessary toward such equality are:

The ABC's of Justice to the Railways

A. The cessation of subsidies to other forms of transportation.

> This means either the raising of the average levies on trucks to a figure much nearer the road costs which they entail, or a reduction in highway expenditures, or much more severe limitations on sizes and weights of motor vehicles—or a combination of these methods to a point where commercial motor transport will be no longer paid for in any part by general taxation or by non-commercial highway users. For water transport, either the government should cease improving and maintaining inland waterways or the costs thereof should be met by levies on waterway users.

B. Equalizing regulation of the various agencies of transportation.

> This would involve passage of the Pettengill bill repealing the long-and-short haul clause of the Interstate Commerce Act, and the enactment of a measure to bring water carriers under the regulation of the Interstate Commerce Commission; together with regulation of intrastate motor transportation in those states which have not yet enacted such legislation.

C. Equalizing labor conditions in the several agencies of transportation.

> The body of legislation which has been built up for the protection of railway labor should be applied to all agencies of transport and, hereafter, no legislation of this character should be enacted which does not apply to competing agencies equally with railroads.

The three preceding paragraphs are the ABC's of the decision regarding the railroads which business must make. For those who desire more details, or corroboration from sources completely free from partisanship, they may be found in Dr. Jordan's address which will shortly be available in the published Proceedings of the Academy of Political Science—and in the address of Dr. H. G. Moulton, president of the Brookings Institution, which was published in the *Railway Age* of November 14, page 719.

Business Men the Most Effective Socialists

We are optimistic, because we believe that the preponderant majority of business leaders are intelligent, and that once the facts are made clear to them, their action will be such that continued private ownership of the railroads will be assured. But, let there be no mistake about it, *the decision for or against socialism rests with business*—not with labor leaders or politicians. *The subsidies to railway competitors and the comparative over-regulation of the railways in comparison with their rivals are the product of the clamor of short-sighted self-seeking business men.* Which is

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RAILWAY AGE

Business Responsible for Government Ownership Trend

There are many business men—some of them in high places—who apparently think their businesses can prosper indefinitely while the railroad industry is subjected to increasingly subsidized competition and regulatory strangulation. But the man of all men in the country probably best situated to observe and report upon business as a whole does not share their view. That man is Dr. Virgil Jordan, president of the National Industrial Conference Board; and Dr. Jordan believes that the railways' plight is a situation in which all private business has a vital stake. The National Industrial Conference Board, incidentally, is a truly representative cross-section of American business and industry. It is supported by contributions of industries and associations which represent practically every variety of business, and its governing board is composed of 100 men, executives of as many different industrial corporations. In its extensive work in economic research the board is pledged to "strict scientific impartiality and avoidance of propagandist activity."

Dr. Jordan's Pessimism

Dr. Jordan expressed his views in an address recently before the Academy of Political Science, which was reported in last week's *Railway Age*. In that address he was extremely pessimistic as to the railroad outlook. Continued subsidization of competitors and prospects of further restrictive regulation would, in his opinion, make difficult or impossible the raising of new capital and would force the railroads into government ownership. This, in his opinion, would not only result in increased costs of transportation for industry and reduce the market for capital goods, but would be the beginning of the socialization of all industry. Dr. Jordan explained that his pessimism came from the fact that other industry was not aroused to its interest in what becomes of the railroads. If it were so aroused, then the tendencies impelling the railways toward socialization could be corrected. Business will eventually awaken but, by the time it does, in his opinion, the trend toward government ownership will have gone too far to stop.

The *Railway Age* does not share Dr. Jordan's gloom, because it is more sanguine that business will awaken to its suicidal selfishness than he is. But, if it does not do so; if a large and influential part of the business community continues, as it has in the past, to seek transportation subsidies at the railways' and the taxpayers' expense; if it remains indifferent to the strangulation of the railways by restrictive labor legislation, not applied to competing carriers, and such regulatory measures as the long-and-short-haul clause—then the logic of events will point inexorably to the outcome which Dr. Jordan predicts.

Is Business Awakening?

But is business awakening to the necessity, in its own and the national interest, of behaving toward the railroads in a manner more consistent with the tenets of private enterprise than it has in the past? Evidence is not lacking that some such awareness is being aroused. At the meeting of the National Industrial Traffic League in New York last week a determined effort was made by interests inimical to the Pettengill bill for fourth section modification to induce the membership to reverse its stand favoring this measure, but they failed in this attempt, after extended debate, by a vote of almost 3 to 1.

Particularly encouraging, to our way of thinking, were some of the speeches made in behalf of the Pettengill bill—one speaker in particular framing his argument as a question somewhat as follows: "How would *you* like it in your business if the government regulated your prices and left your competitor free to make his own?" The members showed by their vote that they would not like it at all, and furthermore that they understood the injustice and inconsistency of the fourth section restriction. Particularly significant, it would seem, was the fact that one of the most eloquent defenders of the N.I.T. League's policy was a man representing interests which do much shipping by the water lines. That is to say, the members of the League —or at least a great many of them—in voting as they did were voting for a *principle*, and not each man for his immediate selfish interest.

This is, to be sure, but one instance on the hopeful side of the railroad situation as it is affected by business opinion—but that it is important cannot be doubted. Because it is not the primary job of industrial traffic men to concern themselves with business

(or even transportation) as a whole—their main function is rather to move traffic at the lowest available rates. If such men can take a viewpoint of sound economic statesmanship with regard to a question as fundamental as fourth section repeal, is it not possible that executives who direct business policy can likewise be aroused to the point where they will favor those policies which will assure the continuance of the railways in private ownership?

Business Still Has the "Gimmes"

The task will not be an easy one. Not all business men, by any means, are cured of the "gimmes," when the prospect of securing transportation partly at the cost of the taxpayers is concerned. Not all of them, by any means, are willing to make the concessions in their immediate self-interest necessary to prevent the first step being taken toward the general socialization of all large-scale industry. To enlist them, those who do understand the situation in its true significance will have to be bolder than they have been in the past. When business men in their short-sighted self-interest advocate methods and policies calculated to destroy private property in transportation, then business and industrial leaders who understand the issues at stake should not hesitate to denounce them and make clear to all the anti-social selfishness which is their motive. Business as a whole bears the blame for these seekers of subsidies and special privileges—and it will continue to bear that blame as long as it tolerates their activities in silence.

The choice is not a difficult one for any intelligent believer in the institution of private property—once he knows the facts. It is the duty of the railroad industry and those closely affiliated with it to see that every business man has these facts so that he may make his decision. What these facts are most readers of the *Railway Age* already know. They may be reviewed briefly as follows:

1. The railroad industry is and must continue to be the principal reliance of the people for the transportation of freight.

2. To maintain their plant, meet maturing obligations and keep in step with technical advance, the railways constantly need new capital.

3. New capital can be obtained from private sources only if earnings prospects are favorable; otherwise—since railway service must be continued—the only other alternative is to get the capital from the government, which in the end means government ownership.

4. The control of railway purchases by the government would immediately give political control over policies of manufacturers selling their products to the railways—preparing the way for making them unprofitable and eventually socializing them too.

5. Governments do not usually look with favor on competitors. Government-operated railways would probably bring socialization of other forms of transport as well (with political control of manufacturers supplying the equipment for other forms of transport).

6. The only way to prevent this first step in a chain of events in the direction of general industrial socialization is to restore railroad credit.

7. Credit restoration, of course, hinges on any steps which would give reasonable assurance of adequate railroad earnings and this assurance cannot be given failing a larger measure of competitive equality between the railroads and other forms of transportation. The steps necessary toward such equality are:

The ABC's of Justice to the Railways

A. The cessation of subsidies to other forms of transportation.

> This means either the raising of the average levies on trucks to a figure much nearer the road costs which they entail, or a reduction in highway expenditures, or much more severe limitations on sizes and weights of motor vehicles—or a combination of these methods to a point where commercial motor transport will be no longer paid for in any part by general taxation or by non-commercial highway users. For water transport, either the government should cease improving and maintaining inland waterways or the costs thereof should be met by levies on waterway users.

B. Equalizing regulation of the various agencies of transportation.

> This would involve passage of the Pettengill bill repealing the long-and-short haul clause of the Interstate Commerce Act, and the enactment of a measure to bring water carriers under the regulation of the Interstate Commerce Commission; together with regulation of intrastate motor transportation in those states which have not yet enacted such legislation.

C. Equalizing labor conditions in the several agencies of transportation.

> The body of legislation which has been built up for the protection of railway labor should be applied to all agencies of transport and, hereafter, no legislation of this character should be enacted which does not apply to competing agencies equally with railroads.

The three preceding paragraphs are the ABC's of the decision regarding the railroads which business must make. For those who desire more details, or corroboration from sources completely free from partisanship, they may be found in Dr. Jordan's address which will shortly be available in the published Proceedings of the Academy of Political Science—and in the address of Dr. H. G. Moulton, president of the Brookings Institution, which was published in the *Railway Age* of November 14, page 719.

Business Men the Most Effective Socialists

We are optimistic, because we believe that the preponderant majority of business leaders are intelligent, and that once the facts are made clear to them, their action will be such that continued private ownership of the railroads will be assured. But, let there be no mistake about it, *the decision for or against socialism rests with business*—not with labor leaders or politicians. *The subsidies to railway competitors and the comparative over-regulation of the railways in comparison with their rivals are the product of the clamor of short-sighted self-seeking business men.* Which is

to say that the strongest force for socialization at work in the country today is not the New Deal, not the labor leaders, not the politicians—but business men who, for their own supposed self-interest, are fostering or tolerating the unfair competitive handicaps which threaten government ownership of the railroads, and the ultimate socialization of all industry which would inevitably follow.

Business has not yet made a determined effort to purge itself of socialism and special privilege. It is always more pleasant to denounce unfavorable characteristics in other people than to seek them out in one's self and in one's associates. Unfortunately for business, such denunciation does not work. The American people, whatever their faults may be, at least are fairly keen in their recognition of hypocrisy. Special privilege is the curse of American economic life—and any intelligent person knows it. The place to get at evil is where it can be reached most easily, and for business that place is in the policies and practices of business itself. Perhaps if the physician would first heal himself, his diagnosis and prescription for national ills would command respectful attention, instead of the disregard and even contempt which has greeted them recently.

Accelerating Traffic Gains

One of the most encouraging factors in the present railway situation is the rapid acceleration of traffic gains, both freight and passenger. Annual freight car loadings reached their low in 1932. On the basis of monthly totals, the 1932 level was exceeded in May, 1933; the 1933 level in January, 1934; the 1934 level in February, 1935; and the 1935 level in January, 1936. The 1931 level was exceeded in September, 1936, and finally, in the second week of November this year, loadings exceeded those for the corresponding week in 1930, although this latter gain may have been due in part to business delayed by the election. The increasing rate of freight traffic improvement is shown by the fact that while carloadings in the first six months of 1936 showed a gain of 9 per cent over 1935, the corresponding gain from July to mid-November was 19 per cent. Indeed, so rapid was the traffic growth that scattered car shortages, averaging less than 200 cars, were reported in the last half of September—the first time such an occurrence has happened since October, 1929.

Likewise, the number of passengers carried by the railways showed a gain, in the first half of 1936, of 8 per cent over the same months last year. This gain then rose to 12 per cent in July and to 16 per cent in August. For the first month since March, 1932, the railways carried, in August this year, a total of more than 43,000,000 passengers. In the first eight months of 1936 the railways carried 28,000,000 more passengers than in the same months a year ago, a gain equal to almost one-quarter of our national population.

In the first half of 1936 passenger-miles showed an increase of 16 per cent above the same period in 1935, while the corresponding gain in July and August combined was 28 per cent. Passenger-miles in August, 1936, exceeded 2,300,000,000 for the first time in 72 months, or since August, 1930. In the first eight months of this year, passenger-miles exceeded the nine-month total for 1935 and 1934, and exceeded the 10-month total for 1933 and 1932. On a relative basis, passenger traffic in the first two-thirds of this year showed gains of 19 per cent over 1935, of 22 per cent over 1934, and of 40 per cent above the same months of 1933.

These traffic gains naturally resulted in substantially increased employment, the number of railway workers exceeding 1,100,000 in September and October for the first months since December, 1931. The gain in employment in October, as compared with a year ago, was 92,671, and as compared with the low point in March, 1933, was 189,567. In March, May, June, July and August, 1936, the monthly railway payroll exceeded $150,000,000 for the first times since December, 1931, and the total railway payroll, for the first two-thirds of 1936, showed increases of $129,000,000 over 1935, of $195,000,000 over 1934, and of $293,000,000 over the same months of 1933.

Thomas W. Lamont on the Railway Situation

If the government owns the railroads of the country, will it be able to avoid going a step further? Can it avoid taking over the whole transportation machinery, trucks, busses and water carriers; or will it, by subsidies to competitors, destroy its own investment in railroads? I believe that private management still has a far better chance of solving the problem, always provided it has the enlightened and liberal co-operation of government.

It would seem that consolidations on a large scale, or some pooling of operations, voluntarily initiated by the railways themselves, can provide the only ultimate solution of the American railway problem today.

As to labor: high wages and good working conditions are greatly to be desired. So is steady and plentiful employment. There can be no prosperity for the country nor for the railroads that is not based upon the prosperity and welfare of labor. But—and note this well—there can be no prosperity for railroad labor that is not based upon the solvency and the prosperity of the railroads.

Our only hope—and it is a hope which I strongly cherish—is that on all sides there will be further quickening of understanding, among the railroads themselves, on the part of labor as well as on the part of government. Only through co-operation on a scale more sympathetic and active than ever before, shall we be able once more to have prosperous railroads that will efficiently and economically serve the great American public.

From an Address by Mr. Lamont (of J. P. Morgan & Co.) before the Academy of Political Science

Corrosion of Steel Cars by Coal

Eighty per cent of the deterioration due to atmospheric corrosion — Nature and effect of leachings from wet coal described

By G. N. Schramm*, E. S. Taylerson† and C. P. Larrabee‡

THE trend away from ordinary steel to copper steel for the construction of railroad equipment resulted from the demand of equipment engineers for inexpensive materials of construction which are more resistant to corrosive media than plain or ordinary steel. This demand, coupled with the necessity for light-weight construction, is now resulting in a trend away from copper steel to the low-cost, low-alloy, high-tensile steels, and the change from one type of construction material to another is based, in many instances, upon the ability of some of the new stronger steels to withstand destructive influences better than copper steel.

Corrosion is responsible for much of the deterioration of railroad equipment. Any comprehensive study of causes and prevention of deterioration should include, as first in the list of causative factors, the various conditions of service of different types of structures. The problems surrounding the use of freight equipment are obviously different from those arising from the service of passenger cars, locomotives, bridges and other right-of-way structures; each class must be subdivided according to types and kinds of service. The deterioration of freight equipment is obviously most rapid in open-top cars, and it is to this type of equipment that first attention should be given. Hopper cars and gondolas are affected to a greater extent than refrigerator, box and tank cars.

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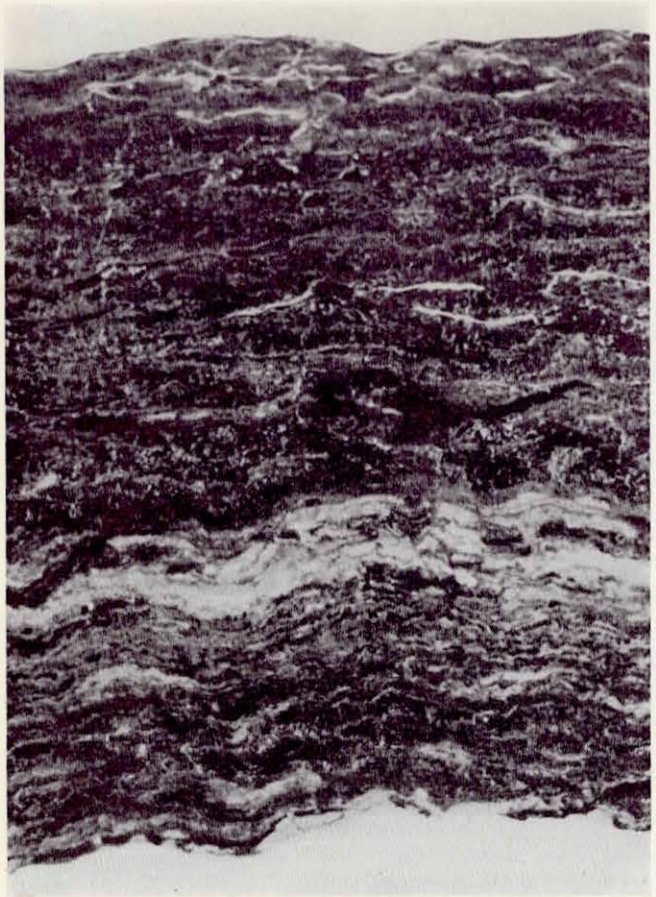


Fig. 1—Photomicrograph Showing a Cross-Section of the Rust from a Hopper Car after 20 Years' Service—Magnification 30 Diameters

Factors Causing Deterioration

Four principal factors other than mechanical damage are responsible for the destruction of hopper cars and gondolas: (1) Atmospheric corrosion, (2) corrosion due primarily to the character of the lading, (3) schedule or method of operation of the cars as affecting the amount of atmospheric and lading corrosion, and (4) abrasion. The first three factors depend upon the three principal types of corrosion—atmospheric, under-water and chemical.

It has been established[1] that the amount of corrosion of a steel structure in the atmosphere depends primarily on the amount of atmospheric pollution, on the length of time the structure remains wet, and on the amount of wet, solid foreign matter, such as dust or soot, which remains in contact with the structure. The rate of corrosion may be further influenced by the angle of slope of the structure, by the smoothness and tightness of joints, by the adherence of the scale or rust film which forms, by the acidity or alkalinity of the polluting liquids, and by the degree of roughness of the surface of the steel. The composition of the steel has an important bearing on the rate at which it corrodes—hence the adoption first of copper steel and the present widespread use of an alloy composition such as Cor-Ten, which contains copper, silicon, chromium and phosphorus.

Because the corrosion of steel, and of other metals, depends upon the exact conditions which surround its use—conditions which determine the kind of corroding mechanism and the rate of corrosion—it is essential to consider the conditions which may exist during the use of a particular type of car. The service to which a hopper car is subjected, for example, may vary from trip to trip, or even from time to time during the same trip. The identification of the causes of corrosion under these complicated conditions is not a simple task, but the determination of the causes when the structure is under the *same* conditions throughout its serviceable life may provide a basis for the estimation of the amount of corrosion under complicated conditions. If this appears impossible, such a consideration will at least facilitate

[1] The Influence of Rainfall and Smoke on the Corrosion of Iron and Steel, by G. N. Schramm and E. S. Taylerson, Symposium on the Outdoor Weathering of Metals and Metallic Coatings, American Society for Testing Materials, 1934.

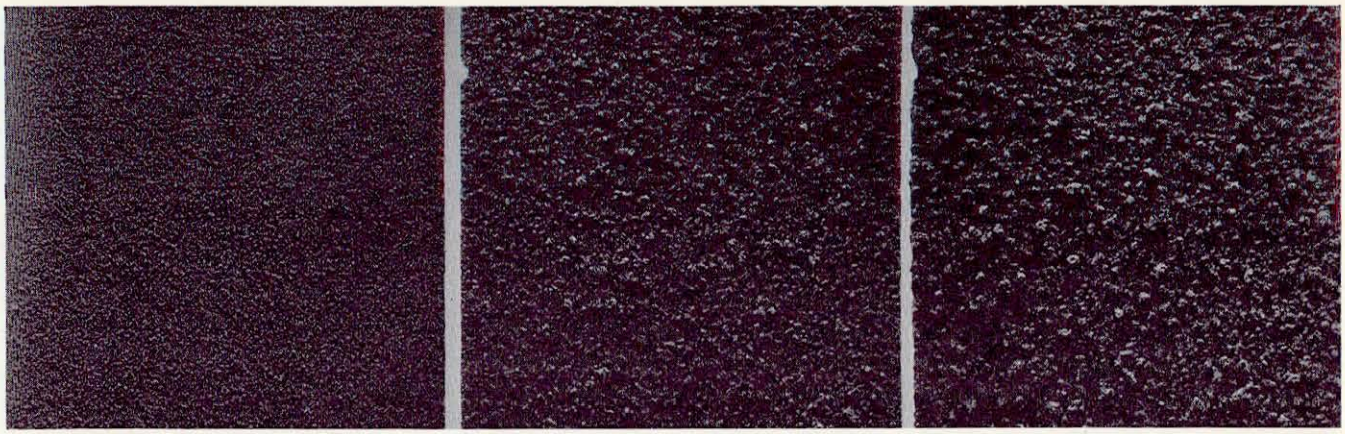


Fig. 2—Rusted Samples of Cor-Ten (Left), Copper Steel (Center), and Plain Steel (Right) after Three Years in an Industrial Atmosphere

the estimation of the durability of different kinds of steel under identical conditions.

Open-top cars are used for the transportation and storage of coal, coke, cinders, sand, stone, etc., some of which are more corrosive to the cars than others. Severe corrosion cannot take place, however, when the car sides and bottoms are covered by these commodities unless the lading is wet. If the lading is wet when loaded or becomes wet from rainfall, then local corrosion may be initiated, and rusting will proceed at a rate which depends on the character of the leachings which filter through the lading, and on the temperature. The leachings may vary widely in their properties; those coming from coal and cinders, for example, are much more destructive than water leachings from sand and stone.

Corrosion caused by atmospheric conditions and by leachings from lading may be affected by the schedule of operation of car equipment. Cars which are stored under certain types of loads for weeks at a time, or even months, may be impaired by corrosive leachings, whereas cars which are stored empty, for long periods of time, are subjected to the relatively mild atmospheric type of corrosion. Cars operating in normal service are, of course, subjected to both atmospheric and some degree of lading corrosion, but the latter will not prove serious except in those cases where, due to faulty design, particles of lading are trapped in seams or pockets.

Atmospheric Corrosion

The corrosion of steel cars is due primarily to exposure to atmospheric conditions. The Freight Traffic Report of the Federal Co-ordinator of Transportation[2] shows that the average period from the time freight cars were placed for loading until released by consignee was 6¼ days for gondola and hopper cars. Other statistics show that in 1930 the number of carloads of freight carried in hopper and gondola cars was approximately 14,219,000, and the total number of hopper and gondola cars, railroad and private, was 947,724. This would require an average of fifteen trips per year by each hopper or gondola car. Since rain or snow falls during approximately one-third of the days of a year, it may be estimated that lading will become wet after a lapse of one-third of the average number of days during which it is under load. If it is assumed that the car is under load during the 6.25 days from the time it is placed until it is released, the lading will probably be subject to rainfall after 2.08 days. The lading will probably be wet during the remainder of the trip, if average precipitation is heavy enough to saturate the contents, and the average period during which the car is susceptible to lading corrosion is then two-thirds of the time it is loaded, or an average of 4.17 days per trip. On the basis of 15 trips per year, the car may be subject to lading corrosion for an aggregate of 62.55 days per year. Of the 14,219,000 hopper and gondola carloads originated in 1930, only 6,024,963 were bituminous coal. That is, only 42.4% of all hopper and gondola loads consisted of bituminous coal.

Therefore, if a car is susceptible to corrosion by all kinds of wet lading during 62.55 days a year, it may be subjected to wet bituminous coal corrosion during a total aggregate period of only 26.5 days a year. These estimates may be summarized as follows:

Average time loaded	6.25 days
Average number of trips per year	15
Average time lading is wet per trip	4.17 days
Average aggregate time lading is wet per year	62.55 days
Ratio bituminous coal loads to all loads	0.424
Average aggregate time bituminous coal lading is wet per year	26.5 days
Average aggregate time car is exposed to other conditions	338 days

These figures are averages only and are subject to variation, but even if the period of exposure to bituminous coal corrosion is doubled (to 53 days) the data indicate generally that coal can be the agent responsible for the corrosion of an open-top car in normal service over a very short period of time only—a period probably too short to be very harmful. However, if the car is exposed to wet coal continuously for a single period of 53 days during the year, corrosive attack may be pronounced.

These data are based on the assumption that the lading is dry when loaded. If, however, it is saturated with water at the time of loading, it will be wet an average

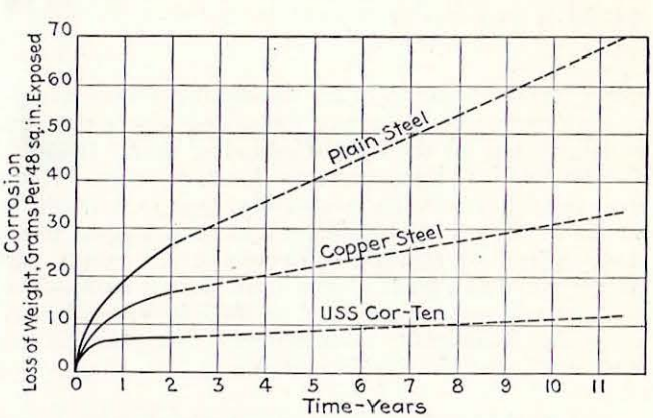


Fig. 3—The Relative Corrosion Resistance of Cor-Ten, Copper Steel and Plain Steel in an Industrial Atmosphere

[2] Freight Traffic Report, Section of Transportation Service, Federal Coordinator of Transportation, Vol. 1, page 88.

of 93.75 days per year. If the lading is bituminous coal, the car will be subjected to wet coal an average of 39.75 days per year, although not for a continuous period and hence with little harm resulting.

It will be noted that freezing weather has not been taken into consideration. Some allowance should be made for frozen lading by those railroads which operate in northern states. Since chemical action stops when lading freezes, and since freezing temperatures prevail in the Middle Atlantic states and other northern states during approximately one-fourth of the year, the average number of trips during which a car may be exposed to lading corrosion is correspondingly reduced from 15 to 11¼. On this assumption, the average time the lading may be wet per year during the non-freezing weather will be 47 days instead of 62.5 days, in which case the average time that bituminous coal lading may be wet per year becomes an aggregate of 20 days instead of 26.5 days.

It should be observed that since freezing weather retards chemical action, it may be well for those railroads

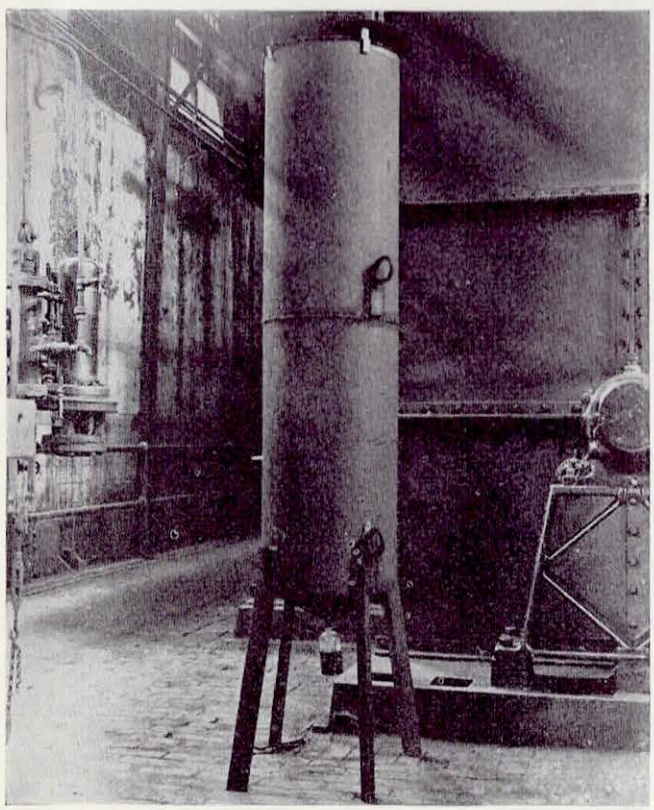


Fig. 4—Stainless-Steel Equipment for the Study of the Leachings from Wet Bituminous Coal—The Depth of the Cylinder Is Equivalent to the Average Depth of Coal in a Hopper Car

storing loaded open-top cars during the winter months to store them on that part of the system where they will remain frozen for the longest period of time. It should also be observed that corrosion does not proceed if the steel sides and bottoms remain dry, and so it would be advisable to store equipment in a location subject to the least amount of rainfall. Furthermore, if empty cars can be stored at a point distant from passing locomotives, the cars will not be subjected to the corrosive effect of accumulated cinders. It is believed that these factors may be of considerable importance over a long period of time.

Since steel corrodes only when wet, coal or other lading retained in pockets or at joints in an open-top car increases corrosion by greatly prolonging the time the structure remains wet. Therefore, every attempt should be made to design equipment which will be completely self-clearing.

Old hopper cars have been inspected in order to determine the history of the formation of the heavy scale which adheres to parts of the cars. This scale sometimes is very heavy, approaching ⅜ in. in thickness. Cross-sections show layers of different thicknesses and colors, indicating that corrosion has progressed in periods, much as seasons of the year produce cross-sectional rings in trees. These may be seasonal layers or layers which are affected by periods of operation. The photograph in Fig. 1 shows a typical cross-section. Examination of the corrosion products has shown them to be substantially the same as the rust which forms on steel that has been exposed only to atmospheric conditions. There is no evidence to indicate that this rust was formed by any other means than atmospheric conditions. The amount of sulfur (sulfate), for example, in scale removed from five hopper cars of widely different age and service was 0.18, 0.22, 0.35, 0.25 and 0.41 per cent, while the sulfate sulfur from corrosion products which formed on copper steel, exposed only to an industrial atmosphere, was slightly greater than any of these figures, namely, 0.45 per cent.

The destruction of hopper cars by coal is probably greatly overemphasized, much of the deterioration by other corrosive conditions being held to be due to coal. It has been said that hopper cars have been destroyed within six months by the leachings from soft coal. As previously stated[3], "the very fact that some of these cases have been recounted on several occasions demonstrates the unusualness of the phenomenon, but the most striking proof that these are unusual cases rests on the fact that the hundreds of thousands of hopper cars in normal service have not been affected by such severe corrosion.

While these troublesome cases can and should be eliminated, the measure of the durability of all cars must not be based on what happens to a relatively few cars subjected to conditions obtaining infrequently. Simply because a few cars have been destroyed by coal corrosion, it must not be concluded that all cars must be destroyed by the same process." It is probable that the cases which have commanded attention involved cars which had already received considerable service before being subjected to longtime storage.

If it is accepted that atmospheric corrosion, lading corrosion, the schedule of car operations, and abrasion are responsible for the destruction of cars, attention may be given to the methods of combating such destruction. The schedule of car operations should provide for full and empty service without long periods of storage under load, particularly of coal and cinders. The character of the lading cannot be changed, but cars should be unloaded promptly.

Low Alloy High Strength Steels

Atmospheric conditions cannot be changed, but steels which are more resistant to severe industrial atmospheres than mild or copper steels can be and are being used extensively to provide equipment which is more durable than that constructed of the usual steels. As described by Whetzel[4], corrosion-resistant high tensile steels are being used by many railroads to combat the problems arising from the rapid destruction of ordinary steel equipment. The composition and physical properties of Cor-

[3] A High Tensile Corrosion Resisting Steel for Railroad Equipment, by R. F. Johnston and G. N. Schramm, Proceedings Railway Club of Pittsburgh, November, 1934.

[4] Modern Steels and Weight Reduction, by J. C. Whetzel, American Iron and Steel Institute, May 23, 1935.

Ten, the most widely used steel of this type, have been described elsewhere[5].

Coal Corrosion

The corrosion of steel cars by *coal* depends largely on the kind of coal and the length of time coal is stored in a wet condition in the cars. Long storage permits two corrosion mechanisms to act on metal parts: (1) attack by leachings which contain appreciable amounts of ferric sulfate, and (2) corrosion set up by the constant physical contact of particles of wet coal against the metal sides and bottoms.

Solid particles in constant contact with metals which are continually wet, produce oxygen concentration cells or salt concentration cells in which the concentration of either salt or oxygen dissolved in the water under the particle differs from that in the water adjacent to the particle. This difference in concentration results in local electrolytic or battery action, and causes and promotes corrosion of the metal under the particle.

These two forms of destruction—attack by leachings and attack by particle contact—react on nearly all metals and are not to be construed as pertaining to steel alone. Contact corrosion may also result from the contact of other kinds of wet particles, such as sand or stone, against metal surfaces, but in the case of stored coal, ferric sulfate corrosion conceivably may proceed without contact corrosion. The size of the material of which the lading is composed has also an important influence on the extent of contact corrosion and on the length of time the lading remains wet. Lading consisting of material of small size may produce a greater amount of corrosion.

Several tests have been made to determine the rate of corrosion of different kinds of steel by wet coal. In co-operation with one of the eastern railroads, clean (pickled) pieces of different steels were fastened to the bottoms and sides of hopper cars which were subsequently loaded with coal and the coal wet with sufficient water to cause a small but continuous flow of leachings. The cars were kept under load for a period of six months. A careful study of the results of this test shows that it would be necessary to subject a scale-free hopper car to ten periods of similarly severe corrosion to completely dissolve the sides and bottoms. It is estimated, however, that perforation of the plates or sheets caused by pitting would be extensive enough to require replacement of the sheets after not more than five such periods of exposure.

Under the most severe conditions as represented by a test of this kind, in which pickled sheets were subjected to continuously wet coal, the car body might require replacement in approximately 2½ years. The plates in the bodies of conventional hopper and gondola cars remain serviceable for approximately 9 to 12 years, the exact length of time varying with the kind of steel and the particular service conditions. Destruction of the plates by the severe corrosion induced by stored wet coal for repeated periods of six months' duration may occur, therefore, in only approximately one-fifth of the time of average car "life."

In another test, made by a mid-western railroad, two hopper cars, one constructed of Cor-Ten and the other of copper steel, were allowed to stand loaded for six months with two sizes of coal containing 2.5 per cent sulfur. The decrease in thickness of the plates in different parts of the cars was measured by a micrometer. The average loss in thickness was 0.0014 in. for the Cor-Ten car and 0.0030 in. for the copper steel car. The largest loss in thickness occurred in that part of the car containing coal screenings, the loss being 0.0037 in. for Cor-Ten and 0.0072 in. for copper steel. This would indicate that under the most severe conditions the plate would be completely destroyed in from 67 to 35 such storage periods, depending upon the kind of steel used in the construction of the car. Perforation at local points of attack would occur very much sooner, such perforation necessitating the removal of the car from service. These results are as nearly concordant with those obtained on the eastern railroad as could be expected under the radically different conditions of the two tests.

To estimate the proportion of corrosive action in freight cars which is due to coal leachings, several factors must be considered. As demonstrated above, the average exposure to leachings from wet coal during non-freezing weather is only 4.77 periods of 4.17 days in each year. As will be shown later, the corrosive action set up in the first month of storage, even with coal high in sulfur, is only one-thirtieth as severe as the average corrosive action for the first six months of storage, due to the fact that a period of approximately one month is required for the formation of severely corrosive leachings. Many coals have low sulfur content, and the leachings which form from such coals may be only mildly corrosive. In normal coal-car service, the interval between exposure to coal permits the formation of a rust film which serves as a partial protection against the

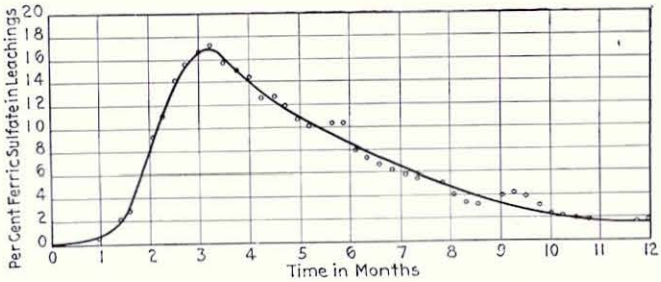


Fig. 5—The Effect of Time on the Concentration of Destructive Iron Compounds which Leach from Wet Coal

action of the leachings. When cars are loaded and emptied frequently, contact corrosion is distributed more uniformly over the plates and does not cause such severe local pitting as occurs when wet coal remains stationary in a car for a long period.

During the normal life of the plates in open top cars, a period of about twelve years, coal corrosion may act for an average of 4.77 periods of 4.17 days each year, or 57 periods of 4.17 days in twelve years. Provided no periods of exposure to leachings are over one month, the corrosive action due to wet coal during the entire twelve years would be equivalent to only about one-thirtieth of one period of six months under continuously wet lading. Even if it is assumed that the coal is so corrosive that it would perforate the plates in six months if stored, the effect of coal leachings in normal service would account for the loss of only about one-thirtieth, or less than 4 per cent, of the plate. If the car is in coal service exclusively, the corrosion attributable to coal leachings would not normally cause the loss of more than 10 per cent of the plate. The other 90 per cent of the deterioration must necessarily be ascribed to other corrosive agents or mechanical damage.

It appears logical to believe that this major destruction is brought about by exposure to the atmosphere and that the fundamental method of obtaining greater serviceability is to construct the cars of a steel that is more resistant to atmospheric corrosion than copper steel. Those low-alloy, high-tensile steels which are actually

[5] New Alloy Steels and Their Application to Car Equipment, by G. N. Schramm, E. S. Taylerson and A. F. Stuebing, *Railway Age*, Dec. 8, 1934, page 761.

two to three times more resistant to severe industrial atmospheres than copper steel will provide much greater serviceability.

Tests carried out by storing wet coal in hopper cars produce conditions which are radically different from those which usually exist, and since service conditions must be duplicated in order to determine the relative serviceability of different materials of construction, it follows that such tests are of questionable value. This is borne out further by the fact that a test of this kind does not include the factor which causes more than 80 to 90 per cent of the average deterioration of hopper cars—atmospheric corrosion. The loaded hopper-car tests did show that the destructive influence of coal leachings cannot be determined by the use of small test pieces placed in different parts of the cars, and, further, that the exposure of thin, clean pieces of steel in order to determine relative rates of corrosion will produce misleading results. Hopper cars loaded with wet coal for test purposes will reveal only what may happen to cars when they are used for storage purposes, and not what will happen in regular or normal service.

Protective Rust Films

Laboratory tests show that freshly pickled samples of steel corrode in ferric sulfate leachings many times faster than samples which have a rust film on them. Samples of steel carrying a rust film which was formed by exposure to an industrial atmosphere for one and one-half years dissolved at a very much lower rate than freshly cleaned samples of the same steel when both were immersed in the corrosive ferric sulfate leachings from wet coal. The difference in rate of corrosion of freshly cleaned pieces and of samples which carried a rust film is due to the protective influence of rust films. That the rust films shown in Fig. 2, which were formed in an industrial atmosphere, are protective is demonstrated by the shape of the curves shown in Fig. 3. If the films had not been protective, straight lines, showing a constant rate of corrosion, would have been obtained. It is seen, however, that the rate decreases with time, even in the case of plain steel. The extreme flatness of the Cor-Ten curve is due to the dense, hard and adherent rust film on that material which is especially protective. This does not mean that a point is not ultimately reached at which the rate is constant, as it appears logical to believe that a rust film can be protective to only a certain extent.

A thorough test of 15 freshly pickled steels and the same number of rusted steels of identical composition buried in wet coal for a period of five months indicated that the samples having the rust films were about 42 per cent more resistant than the cleaned samples. The rust film was formed originally by exposing the pieces to a severe industrial atmosphere for one year. The pronounced difference in behavior of steel when buried in wet coal and when immersed in the leachings which filtered from the same coal indicates the extreme sensitiveness of corrosion tests and the necessity for duplicating service conditions exactly if pertinent data are to be obtained. The protection of steels in the atmosphere, under wet coal and in ferric sulfate leachings by an oxide, however, indicates that the rust film has an important bearing on the serviceability of steel cars.

The Nature of Coal Leachings

The corrosiveness of coal leachings is due to the ferric sulfate that is formed by the action of air and water on sulfur minerals in the coal. The chemical reactions by which this compound is formed from the iron sulfide in the coal, present as both pyrite and marcasite, are very complex. The factors that favor the formation of corrosive leachings are free access of air and water, fineness of the coal, amount of iron sulfide in the coal and high temperature. The last factor is very important since chemical reactions of this nature generally double their rates for each increase of approximately 20 deg. F. When ferric sulfate attacks steel or iron the product is ferrous sulfate which is an intermediate product in the oxidation of the iron sulfide to ferric sulfate. Therefore, in the case of stored coal in iron containers once the action starts it is self-accelerating until the products are washed out by heavy rainfall. Laboratory tests have shown that a comparatively weak solution of ferric sulfate is more corrosive to steel, but not to rust, than equally weak solutions of sulfuric acid.

In order to determine experimentally the rate of the chemical reactions which take place when bituminous coal remains wet for long periods of time, the stainless-steel cylinder 6 ft. high shown in Fig. 4 was filled with 600 lbs. of thoroughly wet run-of-mine bituminous coal, having a sulfur content of 2.6 per cent, from which lumps over 4 in. in diameter had been removed. Obviously a plain steel container, or even a hopper car, cannot be used for this kind of test because the leachings react with the steel before they can be collected and analyzed. The filtrate or leachings were collected in bottles suspended at the opening in the conical bottom of the cylinder. The top of the cylinder was covered in such a manner as to exclude dust but not air. It was kept in a warm boiler house throughout the test. The coal was wet twice weekly with distilled water in amounts equivalent to normal rainfall, and the collected leachings were analyzed.

The curve in Fig. 5 shows graphically the results of the test. The amount of ferric sulfate in solution did not begin to become appreciable until the coal had been in storage four to six weeks, after which it increased rapidly, reaching a maximum after about three months. The concentration then began to fall and at the end of a year it was approximately the same as it was after only six weeks of storage. At no time during the test was sulfuric acid or ferrous sulfate found in appreciable quantities.

These data indicate that coal should not be stored wet in a hopper car for a period of time exceeding four to six weeks. Obviously this period will vary with the kind and size of coal and whether it is bituminous or anthracite, and on the prevailing temperature during the storage period. Corrosion practically stops when freezing starts, and the rate is very low near freezing temperatures. This means, of course, that railroad equipment does not corrode as fast in cold weather as it does during the warm months of the year. Very hard rain storms will produce a flushing action which will cause the immediate removal of the accumulated sulfur compounds without permitting the ferric sulfate to react with the steel. This flushing action will tend to increase the period of time before the leachings begin to corrode the car.

Abrasion

Tests carried out by exposing samples of several steels to the abrasive action of coke show that Cor-Ten is approximately 40 per cent more resistant to abrasion than mild steel or copper steel. These tests were made by fastening, into coke chutes, large samples of different steels which had been pickled. The resistance of this steel to abrasion is another factor which will assist in providing greater serviceability for those cars which carry abrasive loads.

Light-weight cars constructed of Cor-Ten are now in operation on a number of railroads. Examination of

these cars after intensive, assigned coal and coke service, shows them to be in excellent condition. The mill scale is gradually falling away and rust films are being formed. The rate of corrosion of corresponding copper-steel and mild-steel parts appears to be much greater than that of the high-strength steel.

Conclusions

1—The corrosion of steel cars is caused principally by exposure to atmospheric conditions. It is estimated that more than 80 per cent of the deterioration is due to such exposure.

2—Open-top cars in average service are not subject to appreciable corrosion by ferric sulfate leachings from coal.

3—The leachings from wet coal of moderately high sulfur content do not become severely destructive until the coal has been stored from four to six weeks.

4—The storage of wet coal for testing purposes in open-top cars, or of samples of steels in wet coal, do not duplicate the average service conditions of open-top cars, and such tests may be misleading and misinterpreted.

5—Oxides which form on steel are protective in the atmosphere, under wet coal, and in ferric sulfate leachings.

6—Since the major deterioration of open-top cars is attributed to atmospheric corrosion, longer service life may be obtained by using a steel such as Cor-Ten which is much more resistant to severe industrial atmospheres, by actual tests, than plain or copper steel.

Continuation of Emergency Surcharges Asked

WASHINGTON, D. C.

TEMPORARY continuation of the emergency freight charges or "surcharges" authorized by the Interstate Commerce Commission in March, 1935, in Ex Parte No. 115, pending consideration by the commission of a readjustment of rates proposed by the railroads to offset in part the revenues losses which would result from their expiration on December 31, was asked in a petition filed with the commission on November 21 by the principal railroads of the country. Oral argument on the petition will be heard by the commission on December 10.

The petition was filed after the commission on November 18 had issued an order denying for the present, pending the result of hearings to begin January 6, an earlier petition of the railroads dated October 23, which had been docketed as Ex Parte No. 118, to the extent that it sought modification of outstanding orders of the commission and fourth section relief to enable the roads to file tariffs proposing the readjustment. The order of November 18 denied the petition without prejudice to such modification and relief as may be deemed proper after hearing as to the lawfulness and propriety of the increased rates proposed in the petition, and, to the extent that the petition proposes increases in existing freight rates, transfers the issues as to the lawfulness and propriety of such rates as so increased to docket Ex Parte No. 115 for hearing and decision. The proceeding known as Ex Parte No. 118 was discontinued.

On November 19 the commission issued another order reopening No. 115 for further hearing "with respect to the lawfulness and propriety of existing basic freight rates of all carriers by rail or water subject to the interstate commerce act as proposed to be increased in the manner and amounts indicated in the petition referred to," at Washington on January 6 before Commissioner Aitchison.

At the same time the commission put out an explanatory notice to the public, calling attention to its order of October 23 permitting the filing of replies by interested parties to the carriers' petition on or before November 7. The notice continued:

"About 300 replies to the petition have been received. Upon consideration of the petition and the replies the commission has determined that the petition of the carriers, insofar as it prays for modification of outstanding orders to the extent necessary to permit the filing of rates described in exhibit 2 attached to the petition, should not be granted at present upon the mere assertions of the petition and the replies thereto, but should be further heard before it is finally determined, for the following reasons: (1) The modification desired would amount to abrogation of the maintenance clauses of the orders, and it is believed that such action should not be taken except after interested parties have had a hearing upon the merits of the proposals of the rail carriers; (2) The expense to the carriers of publishing tariffs and supplements merely embodying the rate changes outlined in exhibit 2 and the expense to the Commission of preparing and serving suspension orders relating to such rate changes would be very great and the labor involved might serve no useful end; and (3) The decision of the multitude of investigation and suspension proceedings within the maxmium suspension period would impose an administrative burden which can be avoided by the course herein indicated.

"Treating the railroads' petition broadly, and as seeking ultimate approval as lawful of the specified new rates sought to be initiated, the Commission is of the view that the petitioners should be accorded as prompt a hearing as is possible on the issues so raised. It has therefore been decided to reopen Ex Parte No. 115 for further hearing as to the questions raised in the petition docketed as Ex Parte No. 118. The reopening of that proceeding has been decided upon in order to relieve carriers, shippers, and others who already have made extensive presentations in that proceeding from being required virtually to duplicate evidence of comparatively recent date. As an additional means of expediting the hearings any interested party will be permitted to submit relevant and material evidence in the form of a sworn statement, subject to the right of adverse parties to require the presence of affiant for the purpose of cross-examination based on such verified statements. This is substantially the procedure provided in rule 48 of the Rules in Equity to be followed in patent and trademark cases, and was the procedure followed in the Fifteen Per Cent Case, 1931, 191 I. C. C. 361.

"The initial hearing for the purpose of receiving testimony from the railroads in support of their petition is assigned at the office of the Commission in Washington, D. C., January 6, 1937, 10 o'clock a.m. before Commissioner Aitchison, and subsequent hearings will be announced later. It is to be understood that all ancillary and connected applications under the fourth and sixth sections of the act will be heard at the same time."

The railroad petition asked that the present emergency charges be continued for 60 days after the commission completes its inquiry. The railroads previously had asked the commission to allow continuation of the present surcharges indefinitely but this petition was denied on June 9. The commission did, however, authorize continuation of the surcharges for another six months to the

end of this year. Later it denied another petition which asked permission to publish tariffs translating the surcharges into permanent tariffs. The railroads then, after an extensive study of the rate structure by committees and after conference with representatives of the shippers, proposed the readjustment now under consideration, asking that outstanding orders be modified in over 900 specific cases in which the commission had held that the rates therein prescribed should be maintained until further order.

The emergency charges have been producing revenue for the railroads at the rate of over $100,000,000 a year since they went into effect on April 18, 1935. During the first eight months of this year they produced about $77,000,000 additional revenue and without this, the petition points out, the railroads would have failed to earn their fixed charges during those months by approximately $60,600,000. It was estimated that the rate changes proposed in the petition would produce about $50,000,000 of additional revenue in place of that derived from the surcharges, and studies have been continued since of additional changes which are proposed in the new petition. No exact estimate was given of the total but it was stated that the increase in revenue expected from the proposed readjustment would amount, if allowed, to somewhat less than that produced by the surcharges.

After pointing out that the commission cannot hear and determine the issues involved for a considerable period following the initial hearing on January 6, and that, should the emergency charges expire on December 31, the roads would suffer a drastic decrease in their revenues pending the decision, the petition continues in part as follows:

Many important railroads which were able to earn their fixed charges during the first eight months of 1936 would have failed to do so and would have incurred large deficits if they had been deprived of the revenue resulting from the emergency charges. Examples are shown in the following table:

Road	Net Income	Emergency Charges	Net Income Before Emergency Charges
New York Central	$2,367,932	$7,776,400	$5,408,468*
Erie R. R. (including C. & E.)	575,771	2,125,582	1,549,811*
Chicago, Burlington & Quincy	1,029,253	1,515,608	486,355*
Lehigh Valley	444,401	1,189,817	745,416*
Great Northern	777,052	1,411,885	634,833*

* Deficit.

Many other important railroads failed to earn their fixed charges during this period and would have incurred much greater deficits in net income if they had been deprived of revenue resulting from the emergency charges. The following are examples:

Road	Net Income	Emergency Charges	Net Income Before Emergency Charges
Baltimore & Ohio	$860,806*	$4,593,056	$5,453,862*
Illinois Central (including Y.&M.V.)	2,692,759*	2,249,017	4,941,776*
Delaware, Lackawanna & Western	952,564*	1,069,637	2,022,201*

* Deficit.

Still other important railroads would have earned their fixed charges during the first eight months of 1936 without the revenue attributable to the emergency charges, but if they had been deprived of this revenue their net incomes would have been reduced by large amounts. Examples follow:

Road	Net Income	Emergency Charges	Net Income Before Emergency Charges
Southern Pacific Co. (including Texas & New Orleans)	$2,754,506	$1,394,383	$1,360,123
Pennsylvania R. R.	19,443,068	10,091,102	9,351,966
Atchison, Topeka & Santa Fe System	3,174,299	1,592,510	1,581,789

While the rate of return on property investment of the Class I railroads for the first eight months of 1936 of 2.3 per cent (which would have been only 1.8 per cent in the absence of the emergency charges) was more favorable than the corresponding figure during the depth of the depression, it compares very unfavorably with the rate of return of 4.67 per cent for the average year in the five-year period 1925-1929. Again, the net income for the first eight months of 1936 of approximately $16,400,000 (which would have been a deficit of approximately $60,600,000 in the absence of emergency charges) is to be compared with an average annual net income of $773,283,114 for the period 1925-1929.

During the first eight months of 1936, railroad companies having an aggregate mileage of more than 113,000 miles, constituting 48 per cent of the total Class I railroad mileage in the United States, failed to earn their fixed charges by $108,000,000; and if the emergency charges had not been in effect, railroad companies having an aggregate mileage of more than 155,200 miles, constituting over 65 per cent of the total Class I railroad mileage in the United States, would have failed to earn their fixed charges by approximately $145,000,000.

Taking the year ending August 31, 1936, the Class I railroads had an actual net income of approximately $96,400,000; without the revenue of approximately $115,000,000 attributable to the emergency charges there would have been a deficit of approximately $18,600,000 in net income.

The actual rate of return on property investment for the Class I railroads for the year ending August 31, 1936, was only 2.32 per cent; without the revenue resulting from the emergency charges the rate of return would have been only 1.88 per cent.

Although the volume of traffic during the current year has shown an improvement as compared with the years immediately preceding, it is self evident that the railroads are not in a position to withstand the loss of revenue which would result from the elimination of the emergency charges during the period the commission is considering the changes in base rates and charges under its order in Ex Parte 115 of November 18, 1936. Even with the continuation of the emergency charges for this period the railroads will still be in dire need of additional revenues which are to be obtained, if at all, only in the event of a very substantial increase in the present volume of traffic.

The emergency charges were authorized by this commission upon a showing by your petitioners that operating expenses, on the basis of 1935 business, had increased by some $260,000,000 as a result of increased unit labor costs and increased unit prices of materials and supplies. The unit costs of railway labor are now the same as at the time of the previous showing, and the unit prices of materials and supplies are slightly higher. The increased operating costs, due to these increased unit costs and prices on the basis of 1936 business, will be more than $300,000,000.

Early in the year 1937, the carriers will be required to pay into the treasury of the United States, under Title IX of the social security act, 1 per cent of the total wages of their employees. In addition to such payment, the carriers will be called upon to pay into the treasury either 3½ per cent upon their total payrolls, under the act to levy an excise tax upon carriers approved August 29, 1935, or to pay 1 per cent upon said payrolls under Title VIII of the social security act, unless both such acts should be declared unconstitutional. While in many cases, reserves have been created to care for some or all of these prospective payments, yet the fact remains that the carriers will be required to disburse large sums in cash by reason of these enactments.

Under all the circumstances, the carriers respectfully submit that it is not in the public interest that their revenues should be decreased after January 1, 1937, by a sum which will represent an abrupt drop of approximately ten million dollars a month.

THE TRAFFIC COMMITTEE of the Metropolitan Traffic Association of New York will inaugurate on December 10 a series of classes designed to broaden the knowledge of the association's members in traffic work. Each session of the new course which was outlined at the Association's November 12 meeting by C. J. Baker, chairman of the Traffic Committee, will consist of a question period followed by a short lecture on a traffic topic of current interest.

Railway Purchasing—A Problem in Co-operation*

Improper practices outlined and square dealing urged in frank discussion of relations of buyer, seller and consumer

By U. K. Hall

General Purchasing Agent, Union Pacific System, Omaha, Nebr.

IT is difficult to approach any discussion of railway supply work without first harking back to the stores department. Every individual connected with the railroads or allied industries is somewhere or in some way vitally affected by the influence and activities of the stores departments. The railroads cannot operate without materials and supplies. The using departments are too busy taking care of their own problems to bother with the material, and the stores department must therefore see to it that the using departments are not handicapped by shortages or mishandling. On the other hand, the stores department always has before it the question of stock turn-over. In other words, the duty is to have sufficient material on hand, and also to keep an eye on the investment. It must have the co-operation of all the users of material, regardless of the department.

Purchasing Agents As Dictators

In his relations with the using departments, it is my opinion that it is not up to the purchasing agent to endeavor to dictate to users concerning the character of material that should be ordered, except where the mutual interests of the railroad's general policy are involved. I realize that this thought may be at variance with that of some purchasing agents; nevertheless, I feel keenly that the heads of the using departments are the ones most vitally interested in the operating expenses of their departments. They are technical experts and know what is necessary and what is best suited to their needs. I feel that the using departments are the ones to specify special machines or equipment, and, in conjunction with the laboratory or test departments, to specify the character of materials to be ordered. It then falls upon the purchasing agent to obtain to the best advantage the materials and supplies which, in the judgment of the using departments, are best suited to those needs.

There are variations in all human beings. Therefore, there are variations in purchasing agents, for, after all, purchasing agents are human. However, despite differences in methods, practices and procedure, the average purchasing agent of today believes in playing square, in laying the cards on the table, and looking at both sides of any situation. The purchasing agent has an equal right to expect just as fair and square treatment from salesmen as the salesmen have a right to expect fair and square treatment from the purchasing agent.

Friendship in Selling

What is fair treatment? Personally, I feel that in offering prices or rendering bids on the general run of material, the purchasing agent has a right to expect the first bid to be the lowest and the only figure which the seller has to offer. I do not believe in receiving a price and then haggling or working towards a reduction. The most satisfactory way to purchase material is to have all friends realize that the prices they offer are the prices at which they will either receive or lose the order. Friendships are of tremendous value, not only in our lives but in our official actions, and no man can succeed without friendly contacts. However, the salesman should not expect to obtain an advantage over his competitors because of his friendship with the purchasing agent. Attempts of salesmen to obtain confidential information about the prices quoted by others is the wrong use of friendship.

The purchasing agent who encourages suggestions as to substitutions, improvements or changes in specifications, by permitting firms to demonstrate or submit samples, will, at least, have the satisfaction of knowing that he is getting his money's worth. No doubt the percentage of changes for the better will more than offset the effort. Furthermore, his willingness to co-operate with the suppliers gives them an incentive to continue their efforts to serve.

In fairness to concerns to whom price inquiries are mailed, the descriptions of material should be complete with definite specifications, so that there will be no encouragement to quote the price of inferior material. It is our practice, where necessary, to submit samples or request that representative samples be furnished when it is impossible to show the exact material required.

The purchasing agent's duties embrace something else than the browbeating and chiseling of peddlers. His duties are manifold and important, involving a knowledge of the materials he uses and buys, the market conditions confronting his suppliers and their anticipated price changes and the delivery prospects.

With the rapid change in the development of industries, new materials and devices are

"It is not up to the purchasing agent to endeavor to dictate to users concerning the character of material ordered. The using departments are most interested in the operating expenses of their departments. They know what is necessary and what is best suited to their needs. They are the ones to specify special machines or equipment, and, in conjunction with laboratory or test departments, to specify the character of material to be ordered."

* From an address before the Pittsburgh Railway Club, Pittsburgh, Pa., on November 19, 1936.

constantly being marketed and it is the added duty of the purchasing agent to investigate such devices and materials to see if they can be used to advantage by his company. Our railroad has listed in its stock books approximately 80,000 items which are regularly stocked and purchased. In addition, special materials and items of equipment are necessary. In spite of the continuous standardization and simplification which have enabled us to reduce stock items, research and advances in transportation, particularly in recent years, such as the introduction of Diesel-powered streamline trains, air conditioning equipment, etc., have overbalanced any reduction in items, and they continue to increase numerically. In a broad sense, there is something to know about all these items. This emphasizes my thought that the purchasing agent must of necessity seek unlimited co-operation, not only from the technical and using departments of his own organization but from the men who represent the sources of supply for all materials. He never knows when he will require information and services from some source or other.

Courtesy in Buying

How can he best establish a relationship with the suppliers that will result in mutual benefit? I believe in fostering an acquaintance with representatives of supply firms. This acquaintance need not necessarily be secured by back-slapping or entertaining. A kind and courteous reception is generally appreciated. The salesman is entitled to prompt and courteous attention from the time he enters the reception room. He should not be expected to wait for an interview beyond the limits of necessity, and when received, he should be given full opportunity to express the purpose of his visit.

In general, the men now selling us materials are sincere and honest. They know the goods which they handle, their process of manufacture, and they should be and generally are acquainted with business conditions in their territories, any contemplated changes in prices and the demands for materials and supplies which would affect deliveries. They should also be thoroughly acquainted with any new products, their use and the economies that can be effected by their introduction. There are exceptions, but, in general, the individual who is selling today is informed and is in a position to impart this knowledge to the purchaser. This is of great value to the purchasing agent and permits him to perform his duties better.

> **"What is fair treatment of salesmen? I feel that, in offering prices or rendering bids on the general run of material, the purchasing agent has a right to expect the first bid to be the lowest I do not believe in haggling for reductions. Salesmen should not expect to obtain through friendship an advantage over competitors. Attempts to obtain confidential information about the prices quoted by others is a wrong use of friendship."**

What a Salesman Ought to Know

Through the course of years and continued calls of salesmen on the purchasing agent, there develops an acquaintanceship and a mutual personal understanding of individuals which cannot help but produce a business relationship which is frank and fair to both parties, resulting in a natural co-operation. Such a mutual relationship can be established with dignity and without partiality or favor. The business of buying is not a personal matter. The purchasing agent represents his corporation first and is expected to purchase to the best advantage for his company, considering all factors, such as price, quality, reliability of source and delivery. The sales representative is likewise not in a personal enterprise. He represents his company and establishes the reputation of his employer.

We believe that a sales representative, in addition to being entitled to a courteous and prompt reception, is also entitled to a full hearing in order that he may present his materials or specialties properly; and if he sells an item which must be approved by the using department, he should be permitted to contact this department with the full co-operation of the purchasing agent. If he is bidding on special items, he should be furnished with complete specifications, drawings, etc., so that he can present an intelligent bid. He should likewise be given the understanding that he will receive every consideration equal to that of his competitors and that, regardless of personalities or friendship, he is not entitled to any undue consideration.

I believe, further, that a source of supply should attempt, through every reasonable effort, to follow up the use of its material. If the items involved require any special instructions governing their use, the manufacturer should service such devices to see that the utmost utility is obtained. Placing an order should not close a transaction for the salesman.

With little difference in prices quoted and the fact that deliveries are much slower than they have been, we are compelled at times to place orders with firms offering the best deliveries; and co-operation on the part of representatives in having shipments of material made as promised will go a long way toward getting them orders at this time when material is being used in larger quantities than during the last four or five years.

In many instances where delivery is of utmost importance, we have found, after placing an order with a definite specified delivery, that the sales representative did not recognize his responsibility to see that his firm met the delivery requirement. Such delays result, in many cases, in material loss to the customer. On the other hand, the customer should be informed, wherever possible, of price advances so that he can protect himself where it is deemed advisable. He should be informed of general market conditions within the specific industry, and, where special information is desired, such as prices for estimating purposes or special materials required for an unusual purpose, the co-operation of a salesman and his firm is very important. We have all had experiences where prices have been reduced volutarily by manufacturers when conditions would permit. Again, we have had price advances called to our attention that would permit us to stock certain items of material at a distinct saving. Manufacturers who establish such policies cannot help but impress the customer with their spirit of fairness, and the results are mutually profitable.

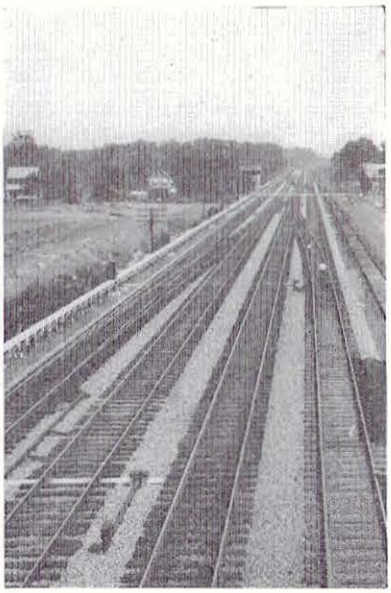
Established Source of Supply Desirable

The purchasing agent also desires an established source of supply. There is nothing to be gained by merely changing from one establishment to another unless to obtain better prices or improved quality. Some salesmen suggest that a certain firm has had the business long

(*Continued on page 792*)

Modern Signaling and Track Maintenance Feature Club Discussion

Speakers at meeting of the Central Railway Club review past developments and increased demands arising from present-day high-speed operation



Track Construction and Maintenance Have Kept Pace With Traffic Demands

APPROXIMATELY 360 members and guests, representing 13 railroads, attended the "Maintenance of Way and Signal Night" meeting of the Central Railway Club of Buffalo, on November 12, which was addressed by John V. Neubert, chief engineer, maintenance of way, New York Central System, and Burt T. Anderson, director, Bureau of Railway Signaling Economics. The meeting was the third of a series of educational programs being conducted by the club in an effort to acquaint the officers of the different departments more thoroughly with the specific problems of the individual departments, to the end of increasing still further the efficiency and appeal of rail transportation. The remarks of Mr. Neubert and Mr. Anderson are given, in part, in the following.

Track Maintenance Has Kept Pace

By John V. Neubert

From the simple track construction of the early days of railroading, built to carry locomotives of three tons gross weight, operated at a speed of about 15 miles an hour, has been evolved the modern track and roadbed which must safely carry locomotives weighing approximately 175 tons, operated at speeds of 80 or more miles an hour. The newspapers, a few days ago, told of a trial run of one modern train which made an average speed of 83.3 miles an hour for a distance of 1,017 miles. The greatest speed attained on this trip was 116 miles an hour, while for 26.6 consecutive miles, an average speed of 105.8 miles an hour was maintained. Freight trains as well as passenger trains are constantly increasing speeds.

To meet these increasing traffic requirements, the track structure has kept pace. The roadbed has been materially widened and reinforced; cuts have been widened, and in many cases provided with retaining walls, and drainage, probably one of the most important elements in roadbed and track maintenance, has been greatly improved.

In the early days, dirt, cinders and run-of-pit gravel predominated for ballast. Today, ballast generally consists of crushed stone, crushed hard slag, washed gravel, chats or cinders, or other similar materials. Today also, ballast is applied to a much greater depth, so that the resultant of the rolling loads is distributed uniformly over a greater area of the roadbed. I believe that a well ballasted track, of selected ballast, preferably crushed stone or possibly crushed hard slag, keeping in mind at all times drainage, is equally as important a factor in proper and economical track maintenance as rail and tie conditions.

Treated Ties Prove Economy

From the granite blocks and wooden stringers employed in the original railway tracks in this country, the crossties or sleepers of today are made from selected timber which is cut to specified dimensions, seasoned, and adzed and bored prior to treatment with a standard amount of preservative. The question of the treatment of ties and other similar timbers is no longer a problem of research. On the contrary, timber treatment is fully recognized today because of the return which it has brought to the transportation industry during the last 25, if not 30 years. The use of preservatives has prolonged the life of crossties from an average of 8 to 12 years to an estimated life of 25 years. This has resulted in less disturbance of the roadbed due to tie renewals, as well as in a largely reduced crosstie account.

Improved Rail Manufacture

Through the years, rail has increased in size and weight until within the last three years the 131-lb. and 112-lb. R. E. rail sections have been adopted universally by the railways of this country. These rail sections, designed to meet the requirements of proper distribution of the metal from the standpoint of rolling mill conditions, provide maximum girder strength and stiffness, as well as insure maximum service life in the track. The width and thickness of the head is ample to secure proper wheel contact and to provide for top wear, and the base is of sufficient thickness to withstand the weakening influence of general service as well as the destructive influence of corrosion.

One of the live subjects today is the corrosion of rail and track fastenings, caused not only by brine, but also by stoker ash. The presence of stoker ash stimulates

electrolytic action, which affects not only the track structure, but the electrical circuits of signal apparatus as well.

The Association of American Railroads, in conjunction with the rail manufacturers, has been sponsoring for the last five or six years extensive research into the cause of rail defects, especially those known as interior transverse fissures. This research, which is being conducted by the University of Illinois, has developed that a large percentage of the fissures have occurred from what are known as shatter cracks. It has also developed that shatter cracks can be almost entirely eliminated by special processes in rail manufacture, involving controlled cooling. One of these processes is termed controlled cooling, while the other is known as normalizing. Both involve a slightly higher cost than standard open-hearth rail.

Besides these improved processes of rail manufacture, the late Dr. Elmer A. Sperry invented and put into use detector cars to locate interior transverse fissures and other concealed defects in the heads of the rails. Sperry Rail Service, of Brooklyn, N. Y., has a number of these cars in use on a rental basis, and several railways, including the New York Central, have built and own their own cars, using the Sperry electrical equipment and method of pick-up for locating defects. These detector cars detect head defects before they reach the state where they can be seen by the naked eye.

In an effort to prolong the life of rails, the railroads, particularly in the last five years, have gone extensively into rail end welding, by both the gas and arc methods. This practice has been perfected through independent research very rapidly during the past few years. Furthermore, individual roads and firms are heat-treating the ends of new rails in order to prevent batter throughout their service life. In addition, the rail manufacturers are prepared to heat-treat rail ends at the mill to accomplish the same thing.

In connection with improvements in rail, the toeless splice bar or joint bar has come into use. In this type bar, which was developed initially because it lends itself readily for use with double-shoulder tie plates, the entire area is effective as a girder in taking the full load. Furthermore, toeless bars are now designed for effective strength across the joint opening as near as consistent with the strength of the full rail section.

Long Welded Rails Being Tried

Another development in track construction in recent years has been the continuous welding of rails. The Delaware and Hudson has the largest mileage of welded rails in this country, with continuous welded sections of track between one-half and one mile in length. The welding has been done largely by the Thermit method, although a form of electric welding of rail ends is now being further developed and a small test installation has been made.

To control expansion and contraction with this type of construction, and to maintain proper alinement of the rail, rigid fastenings and a heavier track structure are required. It is possible also that a slightly heavier ballast section may be necessary. This heavier track construction costs from $2,000 to $4,000 a mile more than the type of construction now in general use. Whether or not expansion and contraction in long welded rails can be controlled over a long period of time is debatable. Furthermore, it is a question to what extent rail failures and the increased maintenance resulting will increase the cost of this type of construction after it has been in the track from 40 to 50 per cent of its total service life.

Tie plates have long been used to protect the ties against mechanical wear and to add strength to the track structure. In recent years, the design of plate that seems to have come into more general use is the double-shoulder type. This design reduces the inward as well as the outward movement of the rail, and it is estimated that it increases the lateral stiffness of the track structure from six to eight per cent, depending upon the size of plate.

Since the development of higher speeds in both passenger and freight service, more care and attention have been given to the alinement and elevation on curves to produce comfortable riding. Furthermore, slight irregularities in surface, grade and alinement are corrected on tangent track as well.

Co-operation of Other Departments Necessary

Another of the problems confronting maintenance of way men is the effect of flat spots on wheels, particularly those in freight service, which impose higher stresses in the track structure. Mechanical and operating department men are aware of this and are attempting to modify and improve existing passenger and freight car designs, particularly trucks.

When considering the effect of equipment on the track, attention should also be given to the cross-counter-balancing of locomotive drivers, and to lightening the weight of rotating and reciprocating parts to reduce their dynamic augment. Improvements in these respects will materially affect the track structure, especially in the case of trains operated at speeds of more than 60 miles an hour. Therefore, the mechanical and engineering groups should work jointly in connection with solving the problems of the economical distribution of moving loads at various speeds, and of reducing to a minimum the factor of impact on the track structure.

Along with improvements in the track structure, the railways as a whole have made use of a large amount of highly developed mechanical equipment to facilitate the handling of their general track maintenance problems. This larger and heavier equipment will be still farther improved from time to time in the future. Along with this further development of the heavier units of equipment, I feel there should be more development of small power units to facilitate the work and relieve the hardship of ordinary labor. Expression has been given to the thought that we have been living in the machine age, which has been a hardship on the people and on industry. I believe this is incorrect. I believe machines have been made and others will be developed which will help and in no way harm mankind, and that the development of machinery should be considered in this spirit.

Railways Still Present Opportunities

Expression has also been made to the effect that the railways, or the transportation field, is a field which young people should not enter. In the early days, prior to your and my time, I believe the transportation field was considered to be the most desirable field to enter. In spite of the conditions and reverses we have gone through in recent years, I still feel that the railway field offers real opportunity for the individual who has initiative and desires it as his vocation.

I do not know at this time the exact future of track maintenance. Since 1929, transportation in this country has materially changed. A large mileage of our branch and secondary lines that at one time had a reasonable amount of traffic, now has very little traffic, and, in fact, on portions of it, traffic has practically disappeared. These lines, in my opinion, have, in general, substantially improved roadbed, ballast, rail, drainage, etc., and are approximately 50 per cent stiffer today than they were ten years ago; far beyond the require-

ments of the traffic they are now carrying. If this is correct, it will allow the railroads of the country to apply and use such money as is available on their main lines, where their heavy traffic now predominates.

I cannot foresee to what extent increased business, when it comes, will be restored to our main arteries and important secondary or branch lines, or to what extent this increased business will require us to restore various tracks and other facilities which we have assumed to be temporarily or permanently out of service, increasing track maintenance and track maintenance costs. However, I am satisfied that expenses will be increased with increased business, and increased with certainty with increased earnings, depending upon our needs, to give economical and efficient service to industry and patrons.

Demands for Modern Signaling

By Burt T. Anderson

The response of the traveling and shipping public in the past two years to the faster schedules indicates that there is a great demand for expedited traffic and increased comfort in travel, and we now have higher train speeds, both freight and passenger, on a greater number of regular scheduled runs than ever in the history of American railroading and without parallel in the world. Practically all of the high-speed mileage is on territory equipped with automatic block signals, two-thirds of the railways with high-speed trains are equipped with automatic train control or cab signals, and practically all of the railways have either centralized traffic control or train operation by signal indication without the superiority of trains.

In this era of modern railroading, 60 m.p.h. freight and 100 m.p.h. passenger trains are the daily practice. Probably the first factor involved in high-speed train operation is increased stopping distance. While this problem has been given more attention with the advent of the light-weight train, actually it is the high-speed freight train which is the determining factor, as not only the speed but also the length and the weight of these trains have been increased. As the energy to be dissipated in a stop varies directly with the weight of the train and with the square of the speed, it is readily apparent that the heavier freight train, rather than the light-weight streamline train, requires the longer stopping distance. In general, the question of stopping distance is one which must be determined by each railroad, depending on the varying speed and weight of the trains, the grades and curves involved, slow orders, and local conditions.

It is at this point that the railroad must determine whether to locate or relocate the signals for longer block lengths so as to provide safety with the higher speeds or select a system of signaling, two-block, three-block, four-block, etc., which will result in a reasonable spacing of trains and the highest possible average speed with the existing trackage. Generally, the increased stopping distance has been provided by locating or relocating the signals, but this practice results in extending the spacing between following trains, with consequent decrease in track capacity. While some railroads do not consider this an important factor, it will be of increasing importance as traffic increases with improved business conditions, and in many cases even today it is a factor of consequence at "bottle-neck" locations.

System of Signal Indications

The simplest form of modern wayside signaling is that provided by a system of two-block three-indication signals, named "clear," "approach," and "stop." If passenger trains are run in a number of sections, or are scheduled close together, or if freight trains are run in fleets, with the longer block spacing, this may result in an excessive interval between trains. It may also result in delays to following trains and in uneven operation due to the brake applications necessary to comply with the indication of successive "approach" signals. Brake applications on long freight trains frequently require a stop. On the other hand, if the traffic density is not too great, this system of two-block three-indication signals may be entirely satisfactory.

The next step is a system of three-block four-indication signals, named "clear," "approach-medium," "approach," and "stop." This system provides a shorter interval between trains, less delay, smoother operation, fewer stops, particularly for freight trains, and a higher average train speed. Similarly, a system of four-block five-indication signals provides an increase in average speed and flexibility of operation over a three-block system. It will thus be seen that the signal system to be adopted should provide for the most economical operation possible, considering all the factors involved in each particular study.

Modern Signaling is Abreast of Modern High-Speed Train Operation

The railroads operating high-speed trains have solved this problem in each of the ways just mentioned. The Chicago, Burlington & Quincy made extensive changes in block lengths between Chicago and St. Paul, Minn., and Chicago and Denver, Colo., particularly on the signaling installed 15 to 25 years ago. The Chicago, Milwaukee, St. Paul & Pacific made similar changes, and in addition in the heavy traffic territory near Chicago, proposes to shorten the blocks and provide three-block four-indication signaling. The Chicago & North Western replaced some disc signals with three-indication color-light signals, and in the heavy suburban traffic territory provided three-block four-indication signaling. The Pennsylvania provided 8,500-ft. blocks with two-block three-indication signals and added three-block four-indication signals for 90 m.p.h. speeds. The Union Pacific increased the block lengths on a two-block three-indication system. The Missouri Pacific installed over 100 miles of new color-light signaling, where manual block was formerly in operation. The Erie installed some new two-block, three-indication color-light signals on an upgrade track and three-block four-indication signals on the downgrade, replacing old semaphore type signals,

while the Atchison, Topeka & Santa Fe is adding a fourth indication at special locations between Chicago and Los Angeles, Cal. The Boston & Maine and the New York Central have installed four-block five-indication signals in heavy traffic territory in order to expedite traffic and reduce delays.

Increased Track Capacity

The advantages to these railways in adopting three or more block signaling may be more clearly understood if it is pointed out that with 8,000-ft. blocks, trains running on clear signals with a two-block three-indication system will be spaced at least 16,000 ft. apart, while with a three-block four-indication system, they may be spaced approximately 12,000 ft. apart (one-fourth less distance), and with a four-block five-indication system, may be spaced approximately 10,667 ft. apart (one-third less distance).

Where trains of varying speed are operated over the same tracks, the signal system should be so designed that each class of train may be moved on as close headway as the stopping distance and safe operating conditions will permit. The signal changes which merely involve the increase of block lengths are adequate for the safe operation of high-speed trains, but they must not impose too great a burden upon the operation of the lower speed trains which often provide the largest part of the railroad's revenue. If there are many trains operating in the 20-45 m.p.h. class, the use of longer blocks, in order to obtain stopping distance for high-speed trains, very materially reduces the capacity of the line. The real solution is to increase the number of restrictive indications by going to three or four-block signaling as required by the local operating conditions. Modern signaling, as designed for safe high-speed train operation, should not be permitted to restrict efficient train operation.

Reducing Delays

While block length is an important factor, there is another phase of high-speed train operation which is equally important and that is the elimination of delay time on the 1,000 or 2,000-mile route in order to maintain the high average train speeds of 55-85 m.p.h. The cruising speeds of 90-100-110 m.p.h. now in operation demand not only the most modern locomotives, equipment and roadway, but also the most modern signaling designed to reduce the delay time for meets and passes to a minimum. Years ago with longer schedules, stops for non-interlocked railroad grade crossings, stops or slow-downs for train orders for meets and passes, delays for hand operation of switches, slow-downs for 15-m.p.h. crossover movements and movements into sidings, were taken as a matter of course. Now, it is a question of absolute minimum delay time in order to maintain the high-speed schedule. Trains must be diverted from one track to another, over longer crossovers, and into sidings at higher authorized speeds protected with power interlockings and modern signaling by means of centralized traffic control, remote control, and modern interlocking facilities, saving every second possible.

An equally important factor in saving delay time to the high-speed trains is the elimination of delays to the slower speed trains on the high-speed routes. This factor is not so important with one high-speed train in operation with slower trains, as the schedules of the slower traffic can normally be adjusted to suit the new operation. But as the number of high-speed trains increase, the proper handling of the slower traffic becomes more of a problem. Facilities must be available for the slower trains to clear the high-speed trains with a minimum delay, and if the high-speed schedules are disrupted, the slower trains must be kept moving without delay. Adequate passing facilities and train operation by signal indication will be of great help in keeping all trains moving.

Centralized traffic control is the most efficient and effective method of directing train movements, providing frequent and immediate "OS" information as to train movements and aiding the supervision of train movements, a very important factor in high-speed train operation. It provides for instantly changing meeting and passing points, aiding the operation of slower trains, facilitating peak train movements—in short, providing maximum track capacity. It conserves capital by making possible a greater use of existing facilities at lower cost and I have yet to learn of any of the 165 installations now in service where the actual results have not been more than anticipated and the operation favorably commented upon by those directly connected with the system. As stated by one operating officer, "I believe it is the greatest development towards expediting train movements and reducing operating costs that we have seen in the past 25 years or more." It is the most modern way to direct train movements and its further adoption in high-speed territory merits greater consideration by operating officers of the railroads.

Cab Signals Improve Train Operation

The majority of the high-speed runs from Chicago to St. Paul, Chicago to St. Louis, Mo., Chicago to the West Coast, Chicago to New York and Boston, Mass., and New York to Washington, D. C., and Richmond, Va., are in train control or cab signal territory. Of particular interest are the Union Pacific Streamliners which are equipped with two types of speed control and cab signals, a cab signal system only, and an automatic stop system for interchangeable operation over four railroads in train control and cab signal territory.

As quoted by one operating officer, "Cab signals provide a greater margin of safety than wayside signals, especially in bad weather, but do not in any respect shorten the so-called 'stopping distance' required for safe operation." High-speed trains operating at 90-100 m.p.h. and over, pass the wayside signals in a very short time, and without question the use of cab signals visible continuously in the cab under all weather conditions are of great benefit in maintaining safe train operation and more nearly perfect schedules. Train control and cab signal devices have proved by over 10 years service their reliability under actual operating conditions and provide the most modern type of protection for high-speed train operation.

Railway Purchasing—A Problem in Co-operation

(Continued from page 788)

enough and feel that it is their turn to secure a share of the railroad's business. This is not, from our viewpoint, a sufficient reason for a change. We would rather have the reputation of staying with an established source of supply as long as it produces the goods at a satisfactory price, furnishes the required quality, lives up to its delivery promises and follows up the use of its materials.

Neither the purchasing agent nor the supply man can be divorced from the other. Both must realize the necessity of co-operation as the keynote of mutual success.

Oris P. Van Sweringen Dies

Succumbs to heart attack less than year after death of his brother-partner

ORIS PAXTON VAN SWERINGEN, who with his younger brother, the late Mantis James Van Sweringen, comprised the famous partnership which during the past 20 years made "the Van Sweringens" a by-word in the nation's railroad and financial fields, died unexpectedly of heart disease on November 23 aboard a business car in the Hoboken, N. J., yards of the Delaware, Lackawanna & Western. His death at the age of 57 years follows less than a year after that of Mantis James who passed away at the age of 54 on December 12, 1935.

Wide World

Oris P. Van Sweringen

Mr. Van Sweringen, accompanied by his secretary, W. H. Wenneman, and Herbert H. Fitzpatrick, vice-president of the Chesapeake & Ohio and the New York, Chicago & St. Louis, was en route to New York where he was scheduled to attend a business conference. As the Lackawanna's Merchants Express, to which the Van Sweringen party's car was attached, was approaching Hoboken, Mr. Van Sweringen complained of a tired feeling and retired to rest. When the train reached the Hoboken station at 11:40 a. m. a physician who had been summoned found Mr. Van Sweringen in a semi-conscious condition. He died about 15 minutes later or shortly after noon.

As pointed out in the *Railway Age* of December 21, 1935, when the obituary of Mantis James was published, the careers of the Van Sweringen brothers have been so closely associated that "the story of one is that of both." The extreme reticence which was characteristic of both may be gathered from the fact that, despite their spectacular financial operations, Oris Paxton's career is covered by 11 lines in the latest issue of Who's Who in America and his railroad career is covered in a like number of lines in the latest issue of Who's Who in Railroading. Neverthless the brothers built up a railroad "empire" comprising about 25,000 miles of lines, having a book value of $3,000,000,000.

Both were born at Wooster, Ohio—Oris Paxton on April 24, 1879, and Mantis James two years later. Both, after a public school education, went to work at an early age, and Oris served from 1916 to 1921 as a member of the City Plan Commission of Cleveland, Ohio, being its chairman from 1919 to 1921.

The first joint business interests of the two brothers were in real estate, their most noted early venture in this connection being the development of Shaker Heights—a Cleveland suburb. The most expedient way to develop a rapid-transit service to this suburb contemplated the use of certain Cleveland facilities of the Nickel Plate. Negotiations for these facilities culminated in 1916 in the Van Sweringen purchase of control of that entire road from the New York Central for $8,500,000. To finance this the brothers borrowed $2,000,000 from Cleveland bankers and gave their notes for the remainder. They placed the late John J. Bernet in the Nickel Plate presidency and the ensuing rehabilitation of the road under his direction is a familiar story.

From this initial venture the rise of the brothers in the railroad world was meteoric. Possessing a native shrewdness in financial matters, they invoked a wide range of corporate devices in attaining control of those lines which they wished to bring under their domination. When prevented by the Interstate Commerce Commission from acquiring control of other lines through purchase of stock by companies already controlled, they resorted to the extensive use of holding companies.

The first step in the enlargement of their railroad holdings was taken in 1923, when they brought about the merger with the Nickel Plate, the Chicago & State Line, the Ft. Wayne, Cincinnati & Louisville, the Lake Erie & Western and the Toledo, St. Louis & Western. This was followed in 1925 by a proposal to effect unified operation and control of the Chesapeake & Ohio, the Hocking Valley, the Erie, the Pere Marquette, and the Nickel Plate, with the latter company as the keystone of the system. When the Interstate Commerce Commission failed to approve this plan, the brothers embarked on a plan for acquiring control of all the desired companies through the agency of holding companies.

In executing this plan stock of the C. & O. that they had acquired through the Special Investment Corporation, wholly owned investment affiliate of the Nickel Plate, was transferred to the Chesapeake Corporation, a holding company, which also acquired stock of the C. & O. from another holding company, the General Securities Corporation. At the same time securities of the Erie and the Pere Marquette were acquired by still another holding concern, the Virginia Transportation Company, which was controlled by the C. & O.

Finally in 1929 at the peak of their pyramid of railroad holding companies, the brothers created the Alleghany Corporation which, directly or indirectly, holds

a predominating interest in the C. & O., the Nickel Plate, the Pere Marquette, the Erie, the Chicago & Eastern Illinois, the Missouri Pacific and the Wheeling & Lake Erie; these companies comprise the principal units in the Van Sweringen railroad "empire" as it stands today. In addition, through the Missouri Pacific, there is controlled a one-half interest in the Denver & Rio Grande Western, the remaining half interest being held by the Western Pacific. The interest of the brothers has not been confined to railroads; their holdings include street car and interurban lines, extensive real-estate and building developments, coal mine properties, and trucking, barge line and warehousing enterprises.

Subsequently, the I. C. C. approved the acquisition of the Pere Marquette directly by the C. & O., although denying the latter company the right to acquire the Erie in the same manner. In fact, the stamp of approval of the commission was placed on the eastern grouping of the Van Sweringen lines as a whole when, in its consolidation plan made public in 1929, it included in system No. 6 the Chesapeake & Ohio, the Nickel Plate, the Pere Marquette and the Erie. Accordingly, in 1932, the C. & O. acquired control of the Nickel Plate from the Alleghany Corporation and these two roads, together with the Pere Marquette, are now operated under a unified management.

The solidarity of the Van Sweringen setup was severely threatened during the depression. The credit of the brothers was jeopardized by the drastic depreciation that occurred in the value of railroad and other types of securities, large amounts of which they had pledged with banks as collateral for loans, while their investments in a number of affiliated companies—notably the Missouri Pacific—were endangered by receiverships. The climax of this situation came in September, 1935, when J. P. Morgan & Co., and affiliated banking houses announced their intention of selling at public auction a block of securities pledged with them as collateral security for loans of $41,600,000, totalling with unpaid interest, $50,000,000. However, rallying new financial interests to their aid, Van Sweringen associates through a newly-organized affiliate, the Midamerica Corporation, stepped up to the auction block and bought back control of their railroad holdings for $3,121,000.

O. P. Van Sweringen served as chairman of the board of the Nickel Plate from 1916 until 1927 when he relinquished that position to M. J. and became chairman of the board of the Missouri Pacific, which position he held at the time of his death in addition to the chairmanship of some 20 other railroad corporations, units of that system and other Van Sweringen lines. Also he served as chairman of the board of the Chesapeake & Ohio from 1923 until 1930.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended November 14 totaled 784,672 cars, an increase of 25,354 cars as compared with the week before, which included Election Day, and an increase of 154,944 cars, or 24.6 per cent, as compared with the corresponding week of 1935. This was also an increase of 4,920 cars as compared with the total for the corresponding week of 1930. All commodity classifications showed increases over last year's figures but merchandise and ore showed decreases as compared with the week before. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

Revenue Freight Car Loadings

For Week Ended Saturday, November 14

Districts	1936	1935	1934
Eastern	161,130	134,740	124,342
Allegheny	151,124	118,615	109,196
Pocahontas	58,588	47,262	42,162
Southern	110,671	89,857	89,759
Northwestern	111,985	81,516	72,845
Central Western	125,660	103,741	93,769
Southwestern	65,514	53,997	52,961
Total Western Districts	303,159	239,254	219,575
Total All Roads	784,672	629,728	585,034
Commodities			
Grain and Grain Products	33,947	29,132	28,037
Live Stock	22,618	17,159	23,262
Coal	157,744	122,409	126,404
Coke	11,072	7,120	5,417
Forest Products	34,505	26,029	21,697
Ore	34,780	13,901	4,052
Merchandise L.C.L.	166,806	158,934	156,952
Miscellaneous	323,200	255,044	219,213
November 14	784,672	629,728	585,034
November 7	759,318	654,947	594,790
October 31	814,175	681,998	613,048
October 24	815,972	710,621	624,808
October 17	826,155	732,304	640,727
Cumulative Total, 46 Weeks	31,818,205	27,961,810	27,690,264

Car Loading in Canada

The holiday on November 11 reduced the Canadian car loadings for the week ended November 14 from 56,860 for the previous week to 53,606, according to the summation of the Dominion Bureau of Statistics. The total was 4,922 cars above the total of the corresponding week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada:		
November 14, 1936	53,606	26,631
November 7, 1936	56,860	26,847
October 31, 1936	57,983	25,943
November 16, 1935	48,684	21,519
Cumulative Totals for Canada:		
November 14, 1936	2,193,105	1,072,551
November 16, 1935	2,095,847	980,020
November 17, 1934	2,069,554	984,681

Personnel-Suggestion Department

By H. T. Doughty

A RECENT article in one of our national weeklies explained what one of the larger railway systems is doing to attract business from what may be called our average traveling public. However, with all due credit to the author of the article and to the railroad concerned, did these so-called new ideas bring out anything which forward-looking railroad men have not known for years? Why not "take stock" and find out what has been known and what has been done? In order to do this, it might be well to ask a few questions and attempt to answer them. These questions only scratch the surface, but they may initiate others which will bring out problems and answers that will react to the credit of the railroads concerned.

Suggestions from Employees

(a). Is it necessary to go outside of the railroad field to get suggestions in reference to the improvement of railroad operation?

The answer to this question is certainly "No," as a

large number of the roads' employees could and would be the systems' best critics if they had a proper opportunity and place to which they could submit their suggestions or criticisms.

The railroad stenographer on a vacation appreciates cheap, well-cooked and well-served meals as well as the school teacher who is also trying to make her dollar stretch as far as possible. Interior decorating is the hobby of the young lady who is clerking in the stores department; surely that clash of color in the new coaches offends her eye. Doesn't John Smith from the roundhouse swear to himself when he can't find a penny to buy a drinking cup, and doesn't his wife carry a box lunch for herself and the children when he manages to get them a pass so they can take that long-looked-for trip home? Bill Jones is only a "car-knocker," but he had to smile when he saw some of the track gang struggling with a problem which had been solved years before on the "rip track." Bob Wilson is a draftsman going up the line a few miles to check some work, but he has to sit alongside of a passenger for the better part of an hour listening to a constant flow of "kicks" about the railroad service in general and several incidents in particular; and the sad part of it is that he cannot even argue the points because the fare-paying passenger has some legitimate complaints. Mr. John Doe of the legal department went over to the ABC Company to straighten out the lease and failed, because of the way it was made up. Burt Williams has lost some excellent freight business because of certain handicaps under which he was trying to work.

Constructive criticism? Every railroad executive has thousands of suggestions at his finger tips; and under the present policies, they stay quietly buried. Why?

Are Suggestions Welcome?

(b). Are railroad executives open to suggestions?

If this question were asked the average railway employee, he would probably state they are not. This state of mind is a result of the attitude of a number of minor officials. Most executives are no doubt interested in improved economical operation and would welcome suggestions to gain this end; but they have inherited a system which blocks its fulfillment. If Bill Jones has a worth-while suggestion, he must take it up with his immediate superior or go over his head. Nine times out of ten, this superior will "kill" the idea or pass it on as his own, in which event it will probably die during the second step. If Bill Jones goes over his superior's head, he will live to see "coals of fire" heaped upon his own head; and at the first opportunity, he will be looking for another job. This condition results in a "buck-passing" fraternity of some minor officials who feel that if things are quiet, it is well enough to leave them alone. A new idea might mean some additional work with the consequent chances of mistakes; and of course, the safest way is to follow the old slogan "the man who never does anything never makes a mistake."

Before blaming the average employee for his mistaken attitude, it should be remembered that these minor officials represent, to him, the official part of the system for which he works and he has no opportunity to contact those who are interested enough to welcome such suggestions or information that he may have.

Suggestion Department Recommended

(c). Would a combined personnel and suggestion department, under the president or executive vice-president, be an asset or a liability?

Many railroad executives will say that their roads have personnel departments; but have they? Do they not mean that they have employment departments whose main function is to file applications?

Why not organize a new department responsible only to the chief executive and of which the employment department is one part? This new department will have and maintain a complete history of every employee on the system with all available data on this employee ready for immediate reference. In conjunction with and as a part of this department will be the suggestion phase of it, which will act as a clearing house for suggestions, complaints, etc. This arrangement will permit any employee to write direct to this department with his suggestions or criticisms. It will be the duty of the department to record the correspondence in the employee's file, answer his letter, and ascertain the value of the suggestion or criticism by checking with the proper department concerned. Complaints by the public would be handled the same way and if investigation disclosed negligence or misconduct on the part of some employee, this would likewise become a part of his file. Of course, it would be necessary to keep the files confidential in order to eliminate the conditions now existing. However, the employee should be permitted to view his own file after making proper application.

Many officials may feel that a so-called "spotter" system is being advocated, but such is not the case. Most instances concerning the unfavorable actions of employees cannot be blamed on the individual but must be blamed on the system which allows such a condition to exist. It is intended that this department should be operated by personnel who are competent to distinguish the difference between legitimate or worthless complaints or suggestions.

The cost of a department of this kind would be negligible and the value unlimited. It would permit the checking of thousands of ideas and suggestions which under present conditions are never brought to official attention; and by virtue of this checking would give improved service to the public and increased recognition to valuable employees.

The Employee's Reaction

(d). What would be the average employee's reaction to an adequte personnel-suggestion department?

Answering this question brings us to the question of morale, the presence or lack of which quality has made or broken companies, armies, and countries. It is a subject which the railroads have treated very lightly and this action has no doubt cost them money in thousands of cases.

The average railroad employee is an ideal person from the standpoint of building morale. He is engaged in a glamorous occupation, in a work which has been built by pioneers who have made history. He is honest and sincere and is so firm in his convictions that he is not a ready target for radical or fanatical teachings. His racial stock is of the best and he is ready at all times to carry his share of the load. He takes an interest in his job and is proud of being a railroad man. He will fight for his rights and for his road with the same enthusiasm that he uses when he brags about that new train or the time she makes.

In view of these characteristics, he or she, as the case may be, would welcome a just and fair personnel-suggestion department. The average employee will make criticisms and will take pride in doing so. He will feel that he has become a more integral part of that system which he prides so much, and that he really amounts to more than another name on the payroll. The person who is interested in keeping his record clean, who is really doing his job, and who is receiving recogni-

tion for making that extra effort, will be proud to know that it is a matter of record. The person who is not interested is probably the one who is afraid of what the record might show. In view of this fact alone, would not the record be worth while.

The foregoing questions and answers touch upon a subject which is very evident in every day life. Talk it over with the man behind the throttle or the one behind a desk. They both have the same interests, the same viewpoints, and the same "kicks." They are interested in their work and their system. They all have their ideas and suggestions, their questions as to why this or that is or is not done. They are a potential power-house worth thousands of dollars, in service, in efficiency, and in good will to both the public and their employers. Why not electrify this part of our systems?

N.I.T. League Refuses to Renege on Fourth Section

THE National Industrial Traffic League, at its annual meeting in New York on November 19-20, after a spirited debate voted down by approximately three to one a proposal that it withdraw its support of the Pettengill bill to repeal the long-and-short-haul clause of the Interstate Commerce Act; and limit itself to modifying the equidistant clause. (The discussion on this subject is dealt with editorially elsewhere in this issue). The League adopted a resolution expressing approval of the action of the Interstate Commerce Commission in refusing to modify without hearing outstanding orders in approximately 1000 decided cases pending action on the carriers' proposal for a general revision of freight rates; and opposed any continuation of the present emergency tariffs beyond December 31.

W. R. Scott, transportation commissioner of Kansas City, was re-elected president. C. W. Braden of New York was elected vice-president and R. W. Campbell of Chicago was elected treasurer. Regional vice-presidents were chosen as follows: R. W. Poteet, New Britain, Conn.; A. L. Reed, Dallas; A. J. Koke, St. Louis; F. A. Doebber, Indianapolis; I. F. Lyons, San Francisco; C. T. Vandenover, Minneapolis; G. F. Hichborn, New York; A. W. Carey, Birmingham. The next annual meeting is to be held in Chicago on November 18-19, 1937, with the likelihood that a spring meeting may be held before that date in Washington.

Lively discussion developed in connection with the proposed report of the committee on highway transportation. The committee recommended that the Motor Carrier Act be amended to include a commodity clause similar to that now applying to rail carriers; the removal of the clause exempting carriers of livestock, fish and agricultural products from the regulatory provisions of the act; and the incorporation of a clause along the lines of section 210 of the present act which would prohibit a carrier from acting as a common or contract carrier in one direction and as an itinerant trucker in the other direction. The membership rejected these three recommendations, and voted to table a proposal that itinerant peddler-truckers be brought under regulation by the Commission. The members approved a recommendation that a watchful eye be kept on railroad acquisition of truck lines to see that no substantial lessening of competition would be involved therein. There was a great deal of discussion on a recommendation that the League take a position that motor carriers be required to furnish tariffs free of charge to bona-fide shippers; this proposal was approved. In the discussion it was brought out, while the committee did not desire to place burdensome expense on small truck operators, nevertheless that the large truck operators were also charging shippers for tariffs, and that one motor tariff bureau was able to pay virtually all its expenses by such levies on shippers.

As for motor carrier safety requirements, the League went on record as favoring co-operation by the Bureau of Motor Carriers and the states to secure greater conformity between state and federal regulation before promulgating any safety regulations for private carriers; that the regulations be applied first to for-hire carriers; and, before any safety regulations for private carriers are laid down, that hearings be held—at which the League's motor transportation committee would appear to represent the League members who operate their own trucks. The League approved a 15-day credit period for truck transportation on the grounds that, not having stations throughout the country as the railroads have, earlier settlement would not be practical. The League would also like to have an amendment to the Motor Carrier Act entitling shippers to refunds from highway carriers in the event of overcharges. The committee reported on its efforts to get the railroads and the truckers to agree on a method of docketing proposed rate changes, and otherwise to make their rate and tariff practices more convenient to the shipping public.

On the subject of fourth section modification, Chairman J. P. Haynes presented a detailed report outlining chronologically the League's position with respect to this clause since 1907. Prior to 1933, he showed, the effort had been exerted principally in the effort to prevent the long-and-short-haul restriction from being made more rigid. Since 1933, however, when a more aggressive stand in favor of reducing restrictions was taken, "we are beginning to get somewhere." The discussion brought out that the rigidity with which the section is being interpreted is "breaking down all the group adjustments in the country" and tending to put all rates on a mileage basis. Several speakers defended the anti-repeal stand of the sections and groups which believe they are favored by the status quo, but the repealers won an overwhelming victory when the question came to a vote.

The League approved the report of its committee on government ownership of railroads, recommending the continuation of its campaign against this proposal; and likewise it will oppose "make work" legislation advocated by railway labor organizations, and will present a bill for the repeal of the land grant rate reduction obligation on the railroads, on the grounds that the railroads through these reduced rates have already fully compensated the government for the land grants. A recommendation that the League oppose that part of the Logan bill which would give a proposed Administrative Court the power to review decisions of the Interstate Commerce Commission was approved. The League also voted to urge that Congress restore the salaries of Interstate Commerce Commissioners to the $12,000 obtaining before the reductions to $10,000 were made in 1933; and that the Senate Committee under the chairmanship of Senator Wheeler, which is investigating railway finances, get its own appropriation for its work, instead of using 60 I. C. C. employees who are being paid out of the I. C. C. budget. It was also recommended that an impartial investigation be made as

to the share each interest should bear in grade crossing elimination projects.

At the luncheon held by the League on November 19, Commissioner Marion M. Caskie was the speaker. This address was a summary of the work of the Division V of the I. C. C. and its Bureau of Motor Carriers—chronological, qualitative and quantitative. He stated the expectation that the Commission would be able to promulgate its regulations for the safety of operation and equipment of highway carriers before the end of the year. In conclusion he said: "Manifestly vigorous enforcement of the Act is essential to its successful administration. I am of the view that for adequate enforcement the Commission will have to depend to some extent on the willingness of the industry to police itself by reporting violations, and to a large extent upon the cooperation of other branches of the government and of state commissions and officials, as well as of the National Industrial Traffic League and other shipper and carrier organizations. Steps have already been taken to enlist this cooperation and have met with cordial and gratifying response. Though the task is great, I feel that it is not beyond the Commission's ability to do a creditable job."

Average Per Diem Plan Saves $12,000,000 Per Year

WASHINGTON, D. C.

AN estimate that the "average per diem plan," placed in effect by the board of directors of the Association of American Railroads on May 1, 1935, is saving the carriers of the country in excess of $12,000,000 a year is given in the annual report of the Car Service Division of the association presented at the annual meeting in New York on November 6. Estimates are also given on various bases that the plan has resulted in a saving of from 198,000,000 to 212,000,000 empty box-car miles a year.

The report also called attention to the "tight" box car supply during recent months and recommends that each railroad survey its supply and requirements for Class A box cars and for cars of large cubical dimensions, both of the 40-foot and 50-foot sizes, taking into account the trend of loading now paralleling that of previous peak years of good business, with a view of providing the number of cars that may be necessary to insure adequate supply.

In discussing the increased carloading during the year the report points out that for the first 40 weeks while loading of car load freight increased 17.6 per cent the l.c.l. merchandise showed an increase of only 1.4 per cent. Following are some extracts from the report:

Detailed statistics are now available covering an entire year of operation under the average per diem plan for settlement of car hire between railroads. This plan was primarily designed to eliminate such of the empty box car mileage as in the past had been due to the per diem urge, so-called. Necessarily, the plan was primarily directed at the reduction of empty mileage made in the direction of predominating loaded movement, a certain volume of empty mileage being necessary to offset the lack of loaded movement in the opposite direction. In brief, the plan provides that monthly settlement for box car hire between roads participating in the plan shall be on the basis of the average detention per month in the three calendar years prior to the adoption of the plan.

As noted previously, there was a precipitate reduction in the figure of empty mileage made by all cars coincident with the inauguration of the average per diem plan. The following figures and chart indicate the extent to which this reduction has been maintained.

	Mileage Data — All Cars			Mileage Data — Excluding Private Line Mileage *	
	1936	1935	1934	1936	1935
January	37.2	38.2	39.7	35.3	36.4
February	36.7	39.3	38.3	34.8	37.6
March	37.5	38.1	39.3	35.0	36.2
April	36.7	38.6	38.9	33.6	36.3
May	37.4	37.3	38.9	34.5	34.6
June	37.3	36.9	38.7	34.2	34.2
July	37.2	37.7	40.0	34.1	34.6
August	...	36.9	38.9	...	33.9
September	...	36.4	38.7	...	33.7
October	...	36.5	39.3	...	34.0
November	...	38.2	39.6	...	36.0
December	...	39.1	39.1	...	37.4

* Year 1934 not available.

Effective with July, 1935, roads have been reporting, separately, figures as to empty mileage made by box and ventilated box cars (which are subject to the average per diem plan) separated as between loaded and empty and as to direction for all divisions and for systems as a whole. From this it has been possible to measure not only the total saving in empty box car mileage resulting from the plan, but also, and more importantly, the saving which it has been possible to bring about in the direction of predominating loaded movement. The following statement shows the percentage of empty box car mileage to total by months for such months as the figures are available and, also, the percentage of empty box car mileage to total mileage made in the direction of traffic:

Percentage of Empty to Total Mileage of Box Cars

	All Box Car Miles	In Direction of Predominating Loaded Movement
Test period (Dec., 1934)	25.6	22.8
July, 1935	23.4	17.0
August, 1935	22.7	15.9
September, 1935	22.5	14.9
October, 1935	21.8	16.5
November, 1935	24.3	19.9
December, 1935	26.4	22.1
January, 1936	23.5	20.1
February, 1936	21.9	19.4
March, 1936	22.2	18.3
April, 1936	22.4	17.7
May, 1936	23.3	17.5
June, 1936	23.4	16.6

On the basis of these actual figures which are available by months it is possible to calculate for all box car mileage during the year July, 1935, through June, 1936, a saving in excess of 212,000,000 empty box-car miles.

On the same basis and using actual figures showing monthly movement of empty cars in the direction of predominating loaded movement, a saving in this direction for the year of approximately 198,000,000 empty box car miles is shown. This is the particular object of the plan, and the record available demonstrates conclusively that the plan has been successful in that respect.

It follows as a natural corollary of any substantial reduction in empty car movement that there will be a corresponding decrease in the number of empty cars handled through yards and terminals, with resultant saving in switching expense as well as in such damage to cars as is caused in switch handling. Data by which this may be accurately measured in a general way are not available at most yards and terminals, but it has been possible to estimate this saving for a number of widely separated points throughout the country.

In a period of increasing traffic such as has taken place during the past months, such substantial reductions in empty car movement through terminals must have produced savings of volume in switching expense. It has not yet been found practicable to determine a measuring stick by which this may be stated or estimated in terms of money. Based on a calculation translating savings in empty mileage to savings in gross ton mileage and of actual cost to railroads per one thousand gross ton miles, it is estimated that the average per diem plan is saving the carriers of the country in excess of $12,000,000 per year.

There have been some difficulties in connection with the application of the plan. Principally these have been due to the excessive detention away from home of Class A cars and failure to obtain a greater observance of the Car Service Rules. Neither of these difficulties or failures is a fundamental fault of the plan,

but their correction is fundamental to its success. Instructions issued coincident to the effective date of the plan provided that cars should be held no longer than reasonably necessary to obtain a load and that Car Service Rules should be rigidly enforced. The Car Service Division, in attempting to correct these difficulties, has specialized on intensive checking as to delays to cars and as to observance of Car Service Rules. Our field force has in recent months been increased to permit a greater amount of this work.

With the continued upward trend of loading, the increasing demand for equipment suitable for high class commodities, and with the margin between car supply and demand generally diminishing, observance of Car Service Rules by all roads is found increasingly difficult. This latter is true not only with respect to cars subject to the average plan but to all types of equipment. The situation will not be found satisfactory until supervision on the part of all is sufficient and applied in such manner as to protect against rule violations now responsible for detention of cars away from the home line.

The matter of adequate car repair program may properly be mentioned in this connection. Misappropriation of cars is frequently due to failure of a road to maintain sufficient of its ownership in condition to meet requirements of the traffic which it originates.

The following principles of the average per diem plan should be vigorously followed by all charged with the duty of supervision of freight car handling.

I. The Car Service Rules to be consistently and effectively enforced.

II. Foreign box cars not to be delayed in anticipation of loading to an unreasonable extent; and the interpretation of "unreasonable" must be varied to correspond with local conditions in each loading territory.

III. Every individual charged with responsibility for box car handling thoroughly instructed as to the rights and obligations inherent in the Plan and subject to adequate supervision to insure compliance.

During the period of heavy summer and fall traffic a generally tight box car supply has prevailed in all parts of the country. In some instances, as in connection with the heavy loading of flour and grain products at Buffalo, there have been temporary periods when proper car supply was made available only by the diversion and use of foreign cars in violation of the Car Service Rules.

Box car difficulties such as have existed have applied principally to specialized demands: (a) standard 40-foot cars in class A condition, particularly those of large cubical capacity, and, (b) 50-foot box cars.

Traffic requiring cars in high class condition has been extremely heavy and in addition, during the long period of surplus, shippers have naturally had the choice of higher conditioned cars for loading which did not always require that type of equipment. Furthermore, the proportion of available box cars in condition for highest type of freight probably is lower than in former periods of active demand. While figures are not available showing the number of cars included in rebuilding programs, the decrease in the number of new cars constructed and the decrease in ownership undoubtedly have a direct bearing on this situation. For instance, at the end of the six years 1925-1930, inclusive, approximately a quarter of all the box cars in service were new within that period, while at the end of the following equivalent period (1931 to August 31, 1936, inclusive) less than four per cent of the total box cars in service were new within that time, and in the meantime there was a decrease of 27 per cent in total ownership.

There are approximately 25,000 fifty-foot box cars in service, of which all but one thousand are owned by western roads, including over 20,000 owned by eight roads. In western territory several important railroads either have no ownership of these cars or a relatively small number. One eastern railroad is building 750 of these cars, not included in the above compilation; the balance of the eastern and southern ownership is distributed among four roads.

As contrasted with this limited territorial ownership, traffic demands for the cars are universal, requirements considerably increasing in recent years by reason of tariff minima established in various territories without reference to the lack of ownership of this type of car. The result has been an improper distribution and considerable misuse of these cars, making it difficult much of the time to protect requirements even in territory where the cars are owned.

A report on the box car situation would not be complete without reference being made to the number of cars awaiting repair. There has been no appreciable gain in this respect during the year, the percentage as of September 1 being 12.9, while for January 1, last, the percentage was 13.3. There is justification for urging a marked reduction in the number of box cars awaiting repairs.

The supply of cars for coal loading has generally been adequate, with a tight situation existing in a few instances. The situation with respect to "no bills" and company fuel on cars is being watched and action taken where practical to increase availability of cars by reducing the number held under load.

Mill type gondolas have been much in demand during recent months, and at times various roads have had difficulty in meeting all their requirements, particularly for cars of longer lengths from 50 to 65 feet. It is recommended that roads requiring this type of equipment to meet the demands of shippers served by them survey their needs with a view of acquiring sufficient ownership to avoid misuse of foreign cars which come into their possession.

It is believed that for the remainder of the year the supply of open top cars will be adequate for the loading of all commodities. Lake navigation closes in a few weeks, which, together with the seasonal decrease in building activities, will release a large volume of open top cars for use in coal traffic.

The average tonnage per car of carload traffic originated in 1935 was 35.6 tons, a record which has previously been exceeded in but a single instance, that being in 1930 when the record stood at 35.7 tons.

In view of the increasing volume of traffic now moving and the lesser number of cars available than in previous years, the subject of heavier loading again becomes important. It is believed that thousands of opportunities exist where the load per car can be increased, thus conserving car supply, merely by making the necessary study and calling such instances to the attention of shippers and receivers. All field employees of the Car Service Division are instructed to follow for improvement any opportunities for heavier loading which come to their attention in the course of their duties. It is recommended that railroads give attention to this subject. The increased net revenue per car handled makes the effort well worth while. The forces of the Car Service Division are available for any such service which individual roads may request.

Monon Reorganization Plan

FIXED interest charges of the Chicago, Indianapolis & Louisville will be reduced 87 per cent under a reorganization plan proposed by the management and submitted to the holders of first and general mortgage bonds of the road at New York on November 23, there cutting fixed interest charges from $1,520,000 to $196,000 annually. The fixed interest bearing debt, excluding $723,000 of equipment trust obligations, which would be left undisturbed, would be reduced from $26,071,000 to $5,043,000 principal amount. The balance of the capitalization would consist of $13,583,000 contingent interest bonds and income debentures, $10,858,000 non-cumulative preferred stock, and $11,721,000 common stock of $50 a share.

The plan proposes the public sale of $1,000,000 first mortgage "A" 4s to raise working capital and finance the reorganization, and the issuance of $4,043,000 of first mortgage "B" 3s to be issued in exchange for some of the present fixed interest debt. In addition, there would be a $12,128,000 second mortgage, with interest at four per cent, and $1,455,000 of income debentures at three per cent. The preferred stock, of $100 par value,

(*Continued on page 807*)

Motor Transport Section

Railway Ownership of Motor Transport Companies

Interstate Commerce Commission issues report showing extent of rail-highway co-ordination

AS announced in the *Railway Age* of November 14, the Interstate Commerce Commission has issued a report on the highway motor vehicle enterprises in which the railways had a financial interest, as of May 1, 1936.

While the report is not complete in many respects, it contains the most comprehensive data on this subject so far issued, and, as such, is of interest to all railway officers engaged in rail-highway co-ordination. The report does not include the huge operations of the entirely railway-owned Railway Express Agency and the Southeastern Express Company. Also, it does not include certain large operations that are handled by the railways directly rather than through the medium of a highway subsidiary, such as the train connection service of the Baltimore & Ohio in New York, neither does it include such directly operated freight and passenger lines as those of the Seaboard Air Line and Great Northern. Similarly, short lines are not shown, although some of their activities, such as those on the Fonda, Johnstown & Gloversville, the East Broad Top, and the East Tennessee & Western North Carolina, are quite extensive. The report also ignores the large and increasing use of trucks by the railways in other than revenue service. The details that are given, however, comprise a revealing picture of the extent to which certain railroads are becoming interested in motor transport. By districts and by railways, the report is summarized in the following:

Eastern District

Baltimore & Ohio: The entire capital stock of Camden Warehouses is owned by this railway; the Blue Line Transfer is owned by Camden Warehouses and operates between Baltimore and Washington in freight service.

The B. & O. also owns 100 per cent of the stock of the West Virginia Transportation Company, operating a number of bus routes in West Virginia since January 1, 1929. The bus company handled 336,299 passengers in 1935.

Boston & Maine: This railway own 100 per cent of the stock of the Boston & Maine Transportation Company, inaugurated in January, 1936, operating extensive bus and truck routes in Maine, New Hampshire, Vermont and Massachusetts, handling 2,076,538 passengers, and 293,497 tons of line-haul merchandise in 1935.

Central of New Jersey: This railway owns outright the Jersey Central Transportation Company, operating bus routes in New York, New Jersey and Pennsylvania.

Chicago, Indianapolis & Louisville: This company owns outright the Monon Transportation Corporation, operating a bus line between Mitchell, Ind., and French Lick Springs.

Erie-Pere Marquette-Chesapeake & Ohio: These lines own 100 per cent of the capital stock of the Erie Land & Improvement Company, the Lake Erie Coal Company and the Virginia Transportation Company respectively. These three controlled companies own 100 per cent of the capital stock of the Standard Car Loading Corporation (one-third each) which company in turn owns 57.72 per cent of the U. S. Truck Lines, of Delaware. This latter company owns the following truck lines:

Motor Express, of Ohio
Motor Express, of Indiana
Motor Express, of Pennsylvania
Motor Express, of Delaware
Cleveland, Columbus & Cincinnati Highway
Anchor Motor Freight, of Michigan
Anchor Motor Freight, of Delaware
Anchor Motor Freight, of New York
Ohio Delivery
Niagara Freight Lines
Superior Transfer Company of Ohio
Consolidated Cartage & Storage Company
Daniel Creedon & Sons Trucking Company
Buffalo Delivery

In addition, the Superior Transfer Company of Ohio, a subsidiary of the U. S. Truck Lines, owns the following companies:

Superior Transfer Company of Delaware
Detroit Delivery
Akron Parcel Delivery

These companies were acquired at varying dates, beginning on September 9, 1930, some being line-haul truck lines, others confining themselves to local pick-up and delivery service.

Maine Central: This railway inaugurated the Maine Central Transportation Company on June 20, 1925. This wholly-owned subsidiary operates in Maine, New Hampshire and Massachusetts, and handled 757,693 passengers in 1935, as well as some freight.

New York Central: This company has a large interest in the Central Greyhound Lines, operating between New York and Chicago, and which handled 2,753,443 passengers in 1935.

New York, New Haven & Hartford: This company owns 100 per cent of the New York & Stamford, and 99.6 per cent of the New York, Westchester & Boston. The parent company and the two subsidiary companies, own the following companies engaged in highway transport:

New England Transportation Company
Victoria Coach Line
I. R. T. Company
Berkshire Motor Coach Lines
Providence, Hartford, Norwich Lines
Berkshire Street Railway Company
County Transportation Company
Soundview Transportation Company
Connecticut Company
Springfield Street Railway Company
Willey-Davis Bus Line

These companies handled 374,898 tons of merchandise in line-haul service, 18,400 tons in local drayage service, and 52,193,836 bus passengers during 1935. The operations of these companies are conducted in New York, Connecticut, Massachusetts, Rhode Island and Vermont.

Pennsylvania: This railway owns 100 per cent of the stock of the American Contract & Trust Company, which owns 100 per cent of the preferred stock and 50 per cent of the common stock of Pennsylvania Greyhound Lines. The companies owned outright by the Pennsylvania Greyhound Lines are as follows:

Montgomery Bus Company
Pennsylvania Greyhound Lines of Illinois
Pennsylvania Greyhound Lines of Indiana

Pennsylvania Greyhound Lines of Virginia
Pennsylvania Greyhound Transit Company
Peoples Rapid Transit

In addition, the Pennsylvania Greyhound Lines have an unspecified interest in the Great Eastern System, own 50 per cent of the Penn Bus Company of Pittsburgh and of the Yelloway Eastern Lines. This railway, jointly with the Reading, under the name of the Pennsylvania-Reading Seashore Lines, owns the Pennsylvania-Reading Motor Lines.

The Pennsylvania also has total or part ownership of a complicated set-up of truck lines. Its wholly-owned subsidiary, the American Contract & Trust Company, also enters into the ownership of the trucking companies, as follows:

It owns 30 per cent of the stock of the Baltimore Transfer Company, which company owns 100 per cent of the stock of the Eagle Transfer Company of Washington, D. C., and of the Motor Freight Express, of Harrisburg, Pa.

It owns 40 per cent of the stock of the Edwards Transfer Company, Columbus, Ohio; 100 per cent of the Excelso Trucking Company; 69 per cent of the Merchants Trucking Company of Norfolk; and 40 per cent of the Moreton Truck Company of Detroit.

It owns 45 per cent of the stock of the Cleveland Cartage Company, which, in turn, owns 100 per cent of the Toledo Cartage Company and the Western Express Company.

It owns 100 per cent of the stock of the Willett Company of Indiana, and 33 per cent of the Willett Company of Chicago, both operating in Chicago.

It owns 84 per cent of the stock of Scott Brothers, and this company, together with the American Contract & Trust Company, owns 100 per cent of the Pennsylvania Truck Lines, which, in turn, owns 100 per cent of the Excelsior Express Company of Pittsburgh. The Pennsylvania Truck Lines, with the American Contract & Trust Company, also owns 85 per cent of the stock of the Buffalo Storage & Carting Company, the other 15 per cent being owned by the Keystone Warehouse Company of Buffalo.

Scott Brothers, on their part, own 100 per cent of the stock of the Peninsula Auto Express Company of Wilmington.

The American Contract & Trust Company also owns 30 per cent of the Union Station Transfer Company, of Dayton, 100 per cent of the Union Transfer Affiliated Company of Philadelphia, and 100 per cent of the Del-Mar-Va Transport Company.

Through its 100 per cent ownership of the Susquehanna Coal Company, the Pennsylvania also owns the Sherman's Valley Transportation Company, which is a wholly owned subsidiary of the coal company.

Reading: In addition to its joint ownership with the Pennsylvania of the Pennsylvania-Reading Motor Lines, this company also owns the Reading Transportation Company outright, which company handled 108,381 tons of line-haul freight and 990,420 passengers by highway in 1935.

Southern District

Central of Georgia: This railway owns the Central of Georgia Motor Transport Company outright, the latter company having transported 2,651 tons of freight and 17,915 passengers over the highway in 1935.

Georgia: This railway operates a bus line, the Georgia Highway Transport Company, which handled 11,266 passengers in 1935.

Illinois Central: This railway owns 100 per cent of the stock of the Mississippi Valley Transportation Company and the Central Transportation Company.

Norfolk Southern: This railway owns the Norfolk Southern Bus Corporation, operating in Virginia and North Carolina, which handled 511,135 bus passengers in 1935.

Richmond, Fredericksburg & Potomac: This railway owns 100 per cent of the R. F. & P. Transportation Company, operating truck and bus lines in Virginia and the District of Columbia; also 49 per cent of the stock of the Richmond Greyhound Lines

Southern: Through its wholly-owned subsidiary, the National Investment Company, this railway owns 100 per cent of the stock of the Yadkin Coach Company, operating a bus line in North Carolina.

Western District

Atchison, Topeka & Santa Fe: This railway owns 100 per cent of the stock of the Santa Fe Transportation Company, of California, operating truck routes in California and of the Santa Fe Transportation Company, operating truck and bus routes in Kansas.

Through its wholly-owned subsidiary, the General Improvement Company, the railway owns 51 per cent of the stock of the Southern Kansas Stage Lines, which, in turn, have a number of subsidiaries, owning 100 per cent of the Santa Fe Trail Stages, the Cardinal Stage Lines Company and the Santa Fe Trails of Illinois. This latter company also has a wholly-owned subsidiary in the Central Illinois Bus Company.

The Southern Kansas Stage Lines also own 73 per cent of the Southern Kansas Greyhound Lines, 48 per cent of the Central Arizona Transportation Lines, 46 per cent of the Rio Grande Stage Lines, 43 per cent of the Western Transit Company, 97 per cent of the Blue Bird Transportation Company and 69 per cent of the Illinois Safeway Lines.

As reported elsewhere in the Motor Transport Section, the Santa Fe has plans already under way for the simplification of this corporate set-up of subsidiary bus and truck lines. Complete returns on the 1935 traffic of these companies are not available; however, partial reports show 101,756 tons of freight handled, and 1,702,669 passengers handled, in 1935.

Chicago & North Western: This railway owns 29 per cent of the stock of the Interstate Transit Lines, a large bus operation, which is reported more fully under the Union Pacific, which owns the controlling interest.

Chicago, Burlington & Quincy: This railway owns the Burlington Transportation Company outright, which handled 578,301 bus passengers and an unreported amount of freight in 1935. Through its subsidiary railway, the Colorado & Southern, the Burlington also has further highway transport company interests. The C. & S. owns 100 per cent of the Denver & Interurban Motor Company, which handled 65,112 passengers between Denver, Colo., and Boulder, during 1935, and of the Colorado & Southern Transportation Company, a truck line.

The C. & S. and the Burlington Transportation Company each own 25 per cent of the Denver, Colorado Springs, Pueblo Motor Way. This latter company owns 33⅓ per cent, and the Burlington Transportation Company another 33⅓ per cent, of the Denver-Salt Lake-Pacific Stages.

Chicago, Milwaukee, St. Paul & Pacific: This railway owns 20 per cent of the Motor Transport Company of Rapid City, S. D.

Chicago, St. Paul, Minneapolis & Omaha: This line, a Chicago & North Western subsidiary, owns 100 per cent of the Wilson Transportation Company, a truck line operating in Iowa, Minnesota and South Dakota, that handled 30,974 tons of freight in 1935.

Denver & Rio Grande Western: This company owns 50 per cent of the Denver, Colorado Springs, Pueblo Motor Way, which owns 33⅓ per cent of the Denver-Salt Lake-Pacific Stages. This first of these bus companies handled 110,657 passengers and the second 17,579 in 1935. As will be observed under stock ownership listed under the Burlington and the Missouri Pacific, both of these bus companies are entirely railroad owned.

The D. & R. G. W. also owns 80 per cent of the Rio Grande Motor Way, operating in Colorado, New Mexico and Utah, which handled 26,174 tons of freight and 60,457 passengers over the highway in 1935.

Great Northern: This railway owns 45 per cent of the common voting stock and 36 per cent of all outstanding stock of the Northland Greyhound Lines, a bus company operating between Chicago and Montana, with many intermediate routes, that handled 2,896,301 passengers in 1935.

Kansas City Southern: This railway owns the Kansas City Southern Transport Company outright, a truck route operating between Shreveport, La., and Lake Charles.

Missouri Pacific: This railway owns the Missouri Pacific Transportation Company, a bus line operating in the Southwest, that handled 1,535,551 passengers in 1935.

The railway also owns, through its highway subsidiary, 33 per cent of the Denver-Salt Lake-Pacific Stages.

Northern Pacific: This company owns and operates the Northern Pacific Transport Company in Montana, which handled 35,408 tons of freight and 56,149 passengers in 1935.

St. Louis Southwestern: This railway owns 100 per cent of the Southwestern Transportation Company, a truck line that handled 59,506 tons of freight in 1935. The highway subsidiary, in turn, owns 16 per cent of the stock of the Southwestern Greyhound Lines.

Southern Pacific: This railway owns the Pacific Electric, which operates interurban bus services in the Los Angeles metropolitan district that carried 17,448,952 passengers in 1935. It also owns the city and interurban bus services in the vicinity of San Jose, Cal., where 1,079,475 passengers were carried. With the Southern Pacific Land Company, a wholly-owned subsidiary, the railway owns 39 per cent of the voting stock of the Pacific Greyhound Corporation and its many subsidiaries, which handled 5,359,149 passengers in 1935. The Pacific Electric owns 66⅔ per cent, and the Pacific Greyhound Corporation 33⅓ per cent, of the Motor Transit Company, which handled 2,527,980 passengers in California in 1935.

The Southern Pacific owns the Pacific Motor Transport Company outright, and this subsidiary owns the Pacific Motor Trucking Company and the Southern Pacific Transport Com-

pany. Between them, these trucking companies handled 620,618 tons of freight in 1935.

Spokane, Portland & Seattle: This railway owns the S. P. & S. Transport Company, a bus line which handled 126,101 passengers in 1935.

Texas & Pacific: This railway owns the T. & P. Coaches, and the T. & P. Motor Transport Company, operating a bus line in Texas, and truck routes in Louisiana, Texas and New Mexico.

Union Pacific: This company owns 71 per cent of the Interstate Transit Lines, the other 29 per cent being owned by the Chicago & North Western. It has several other highway subsidiaries, including the Union Pacific Stages, and the Utah Parks Company. In all, these subsidiaries handled 2,926,782 bus passengers in 1935.

Greyhound Lines Merger

WITH the idea of simplifying the corporate structure of the system, the Greyhound Lines, in which bus routes the railways have large interests, have applied to the Interstate Commerce Commission for authority to merge 19 subsidiaries into six consolidated companies. The new set-up is to be effective December 31, 1936, if it is approved by the commission.

The new line-up will be as follows:

Atlantic Greyhound Corporation, with headquarters at Charleston, W. Va., will include the following:

Atlantic Greyhound Corporation
Atlantic Greyhound Lines of Virginia
Safeway Transit Company

Southwestern Greyhound Lines, with headquarters at Fort Worth, Tex., to include the present Southwestern Greyhound Lines, and the Gold Eagle Southern Lines.

Pennsylvania Greyhound Lines, with headquarters at Cleveland, Ohio, will include the following:

Pennsylvania Greyhound Lines of Delaware
Pennsylvania Greyhound Lines of Indiana
Pennsylvania Greyhound Lines of Illinois.
Pennsylvania Greyhound Transit Company
Peoples Rapid Transit Company

Central Greyhound Lines, with headquarters at Cleveland, Ohio, will include the following:

Central Greyhound Lines of Delaware
Central Greyhound Lines of New York
Central Greyhound Lines of Michigan
Pennsylvania Greyhound Lines of New York

Northland Greyhound Lines, with offices at Minneapolis, Minn., will consolidate the present company of this title with Northland Greyhound Lines of Illinois.

Capital Greyhound Lines, with offices at Cincinnati, Ohio, will include the present Capital Greyhound Lines of Virginia and of Indiana.

Santa Fe Acquires Two Bus Lines

SUBJECT to certain changes in corporate identities, the Interstate Commerce Commission has approved the acquisition of control of the Central Arizona Transportation Lines and the Arizona-Utah Stages by the Santa Fe Trail Stages. The authority was granted contingent upon the following conditions: that the corporate identities of the Central Arizona Transportation Lines, the Arizona-Utah Stages and the Santa Fe Trail Stages be dissolved and that their properties and operating rights be merged with those of the Southern Kansas Stage Lines Company. This latter company will retain its identity, but the 51 per cent of its stock now owned by the General Improvement Company, an Atchison, Topeka & Santa Fe subsidiary, is to be transferred to the direct ownership of the railway. With the acquisition of the two additional bus lines, it is planned to co-ordinate bus-rail service in the territory affected, and to establish through joint rates and schedules, a proposed rail-bus schedule between Phoenix and Chicago, for example, will save 10 hours, as compared with the Santa Fe's present all-rail route.

That portion of the bus line between Flagstaff, Ariz., and Salt Lake City, Utah, has been known as the Arizona-Utah Stages. This route crosses the Colorado river at Marble Canyon, north and east of the Grand Canyon, traversing part of the Kaibab National Forest. Thence, via Mt. Carmel, Marysvale, Gunnison, Levan, Nephi and Provo to Salt Lake City. With a daily schedule in each direction, it traverses scenic and little known territory, most of which is not served by other railways or bus lines. The Santa Fe proposes to advertise the charms of the district as vacation country, to be reached by its through rail-bus schedules and rates.

The lines south of Flagstaff are known as the Central Arizona Transportation Lines, and include two routes between Flagstaff and Prescott, one through Ash Fork, the other via Clarksdale, and a route between Prescott and Phoenix via Wickenburg.

National Truck Show Held at Newark, N. J.

THE third annual National Motor Truck Show, conducted by the New Jersey Motor Truck Association, which was held in the Center Market building, Newark, N. J., from November 3 to 7 inclusive, included exhibits of 66 companies, including 26 truck manufacturers and 34 accessory and engine companies, which displayed 142 motor trucks and parts valued at more than $1,000,000.

A feature of the show was the regional transportation and maintenance meeting, sponsored by the Metropolitan, Philadelphia and Southern New England sections of the Society of Automotive Engineers, which was held in conjunction with the exhibition. The sessions of this meeting covered two days, November 4 and 5, and culminated in a banquet on the second evening, at which Ted V. Rodgers, president of American Trucking Associations, and Jack Garrett Scott, chief of the Section of Law and Enforcement, Bureau of Motor Carriers, Interstate Commerce Commission, spoke.

Mr. Rodgers stressed the public relations job of the motor carrier industry, calling attention to the need for disseminating facts about the extent of the industry's operations, the taxes it pays, the manner in which it serves communities which have no other means of transport, and the employment which it provides. He also emphasized the importance of educating drivers in matters of safety and courtesy and paid tribute to the Interstate Commerce Commission. Mr. Scott outlined the magnitude of the task which came to the I. C. C. with the passage of the motor carrier act and urged that the trucking industry continue its co-operation in the work of effectuating the act's provisions. He also referred to the work of his section, pointing out how it is making progress in the investigation of complaints, and is about to launch court actions against alleged violators.

Joint Motor-Rail-Motor Rates Found Justified

Suspension of Chicago Great Western-Keeshin tariff vacated over protests of railroads

WASHINGTON, D. C.

OVER the protests of most of the rail carriers of the United States the Interstate Commerce Commission on November 17 in a decision of far-reaching importance vacated its order of suspension and found justified a tariff filed to become effective on June 8 by the Chicago Great Western, the Clinton, Davenport & Muscatine, the Keeshin Motor Express Company, Inc., and more than 30 concurring motor carriers (most of them included in what is generally recognized as the Keeshin group), proposing motor-rail-motor joint rates of the same amount as the corresponding rates of the motor carriers for highway transportation. The rates are to apply in the territory on and east of a line drawn from Kansas City, Mo., through Omaha, Nebr., Des Moines, Ia., and Minneapolis and St. Paul, Minn., and on and north of a line through Kansas City, St. Louis, Mo., Louisville, Ky., Cincinnati, Columbus, and Akron, Ohio, Pittsburgh and Philadelphia, Pa., and New York, N. Y., including also Washington, D. C., Baltimore, Md., and points on Long Island.

It was held by the commission that the proposed rates had not been shown to be unlawful in violation of any provision of the interstate commerce act but "by reason of the limited experience under the proposed or any similar arrangement at the time of the hearing, and by reason of the controlling importance which respondents have attached to the all-highway rates in determining the maximum level of the proposed rates, we find it necessary to continue on our own motion our investigation of the joint rates, regulations, and practices of these respondents."

Chairman Mahaffie and Commissioners Porter and McManamy dissented, while Commissioner Miller did not participate in the disposition of the case.

The railroads that did not join in the protest are the Alton, the Baltimore & Ohio, the Central of New Jersey, the Chicago, Rock Island & Pacific, the Kansas City Southern, the Reading, and the Western Pacific. Some of these roads have contemplated a similar arrangement with the Keeshin lines but have been awaiting the decision of the commission as to the kind of a tariff that would be acceptable. The decision also applies to a similar tariff of 16 motor carriers and the Great Western proposing similar through routes and joint rates between points in Minnesota and Wisconsin, on the one hand, and Illinois, Indiana, and Wisconsin, on the other, which had also been suspended.

The proposed rates would apply on class and commodity traffic generally, when loaded in trucks, trailers, or semi-trailers owned by the motor carrier, which originates and delivers the traffic. The vehicles used are generally semi-trailers, each of which is attached to a motor tractor when it is drawn over the highway. The railroad would act only as an intermediate carrier, transporting the trailers on flat cars from and to the interchange points with the motor carrier.

All of the points named in the tariff are on routes of the motor carrier which were operated prior to October 15, 1935. The proposed points of interchange are Chicago, St. Paul, Marshalltown, Iowa, and Des Moines, on the Great Western, and Davenport, Iowa, on the Clinton, Davenport & Muscatine. Facilities for interchange have been provided only at Chicago and St. Paul. Council Bluffs, Iowa, was being considered as an additional point of interchange.

In *Trucks on Flat Cars Between Chicago and Twin Cities*, 216 I.C.C. 435, the Commission found justified proposed rules and charges by the Great Western for transportation on flat cars of loaded and returned-empty trucks, trailers, and semi-trailers between Chicago and the Twin Cities and Minnesota Transfer, Minn. The tariff there approved, which became effective July 7, was filed prior to the date on which the provisions of the motor carrier act relating to the filing of tariffs became effective. It covers a strictly all-rail service open to anyone tendering loaded or empty vehicles, including common carriers, and performed under a railroad bill of lading.

The new tariff contains what are designated as joint rates, such as may be established pursuant to the provisions of section 216 (c) of the motor carrier act. They are said to meet the objections of certain shipper protestants in the related proceeding who feared that the tariff therein approved would be used by contract haulers or private haulers to the detriment of the established warehousing, distributing and jobbing interests at the Twin Cities. These parties favor the proposed rates. That part of the through transportation service which the rail carrier would perform under those rates on traffic interchanged at Chicago and the Twin Cities is identical with that which it now performs under the all-rail rates for the movement of loaded trailers. But under the proposed joint arrangement the motor carrier would issue a through bill of lading for transportation at a specified rate per 100 pounds. The status of the rail carrier would be that of a connecting common carrier participating under joint rates in the through movement.

The Great Western represented that it was willing to negotiate with other common carriers by motor vehicle looking to the consummation of similar arrangements. It also represented that it wished to withdraw the tariff approved in the related proceeding if the suspended tariff was found justified.

The Proposed Service

The service performed by the motor carrier under the suspended tariff would be the same in every respect as that which it performs under its all-highway tariff, with the exceptions that (1) it would not haul the trailers between the points of interchange, and (2) it would move them between the railroad yards and its freight stations at those points. At Chicago, for example, it picks up package freight by the use of gathering trucks operating over city streets and in the surrounding areas. These shipments and others moving from other points

to Chicago by motor truck are assembled at its Chicago freight station for sorting and loading into the trailers. These trailers weigh about 7,500 pounds each and have a capacity of about 20,000 pounds. After a trailer is loaded, weighed, sealed and locked it would be taken by the motor tractor of the motor carrier to the railroad yard at the point of interchange, backed up a ramp and loaded on a flat car of the railroad.

The arrangement substitutes an intermediate service by rail carrier for the service over the highway between points of interchange at which the motor carrier surrenders and again receives the lading.

The proposed through routes reach no points not already served by the respondent highway carriers. Relatively few of the origins and destinations, however, are also stations on the lines of the Great Western. The principal cities on its lines from and to which the joint rates would apply are the interchange points, also Minneapolis, Omaha, Kansas City, and Mason City and Waterloo, Iowa. Many of the stations named in the tariff now served by the motor carrier are also stations on the lines of the protesting rail carriers, including about 100 stations in Iowa, 28 in Illinois, and 12 in Wisconsin. Under the proposed arrangement shipments moving from and to these stations would be handled by the motor carrier over its established routes to and from the nearest interchange point on the Great Western. This situation was the basis for protestants' argument that the proposal would permit the Great Western to invade the territory of other railroads while reserving to itself its own local territory.

Proposed Rate Bases

The proposed joint rates are not related in any way to the all-rail rates on either less-than-carload or carload traffic between the same points. Instead, they are the same as the currently effective rates of the participating motor common carriers for transportation by highway from and to the same points.

All of the proposed rates and the all-highway rates of the motor carrier are governed by Trans-Continental Motor Truck Freight Classification, Sicilia's M.F. I.C.C. No. 1. The proposed class rates between Chicago and the Twin Cities are as follows:

Class	1	2	3	4	5	6
Rate	100	85	70	66	63	60

The rates on quantity shipments weighing from 5,000 to 20,000 pounds range from 95 to 85 per cent of the full class rates. Rates are also provided on mixed less-truckload shipments, subject to certain conditions and excluding certain commodities, 80 per cent of the first-class rates for shipments aggregating 1,000 to 5,000 pounds, and 75 per cent of first class for shipments over 5,000 pounds.

All-commodity rates on trailer load shipments are provided from and to many of the points. To encourage a balanced tonnage, some of these rates vary depending on the direction of movement.

The present all-rail class rates, and the corresponding rates of the forwarding companies, exclusive of emergency charges, between these points are as follows:

Class Rate:	1	2	3	4	5	A	B	C	D	E
Railroad	126	107	88	69	47	57	41	38	28	22
Forwarding Companies	106	97	83	69						

At the time of the hearing the rail carriers also maintained all-freight rates of 55, 72, and 91 cents, minimum 40,000 pounds, 20,000 pounds, and 10,000 pounds, respectively, and an all-grocery commodity rate of 39 cents, minimum 24,000 pounds. Since the hearing they have established, effective September 1, 1936, an all-freight rate of 35 cents, minimum 30,000 pounds, between Chicago and the Twin Cities. This rate is restricted to application over single-line routes and is observed as a maximum from, to, and between intermediate points. This adjustment is the subject of investigation in Investigation and Suspension Docket No. 4231, *Commodities Between Chicago, Ill., and Twin Cities,* heard September 28.

Many articles are rated lower in the motor truck classification than in the corresponding rail classification. Consequently, the differences in rates for the two types of service are frequently greater than a comparison class for class indicates.

In practically all instances the proposed rates are lower than the all-rail rates in effect at the time of the hearing. Many of the proposed rates exceed the all-freight rates for similar distances which are in issue in Investigation and Suspension Docket No. 4231.

Some of the highway rates for distances of 450 miles or greater and some of the motor ratings have been increased since the suspended tariff was filed, the report says. Corresponding increases will be made in the proposed motor-rail-motor rates between the same points if they are permitted to become effective, it is respondents' purpose to maintain them on a parity with the highway rates. The increases made in the highway rates, principally for distances in excess of 500 miles, became effective June 16, 1936. A witness for one of the motor carriers explained that these increases were necessary to secure revenue adequate for profitable operation; and that since the rates, as increased, exceeded those maintained by other motor carriers, it was not expected that they would attract much traffic. The Keeshin company developed, by a cost study, that its rates for distances up to 500 miles yielded a profit, but that for longer hauls rates higher than those in effect prior to June 16, 1936, were necessary to profitable operation. For example, its first-class rates between the Twin Cities and other points were increased as follows: New York, $2.08 to $2.39, as compared with the present all-rail first-class rate of $2.17; Gary, Ind., $1.19 to $1.47, as compared with the present all-rail first-class rate of $1.26.

The Great Western would receive as its division of the proposed joint rates on traffic interchanged at Chicago and St. Paul $42.50 for each loaded trailer, or $85 for each car carrying two loaded trailers. The division of $42.50 is based on the approximate cost to the motor carrier of moving the trailers over the highway of 10 cents per trailer-mile for the highway distance of 425 miles between those cities, shown by a cost study made by the Keeshin company relating to operations between Chicago and the Twin Cities, and of record in the related proceeding. There would be no empty movement of railroad equipment, as the trailers must be returned by rail either loaded or empty. If some of them moved empty in one direction the railroad would be compensated on the basis of $21.25 for each empty trailer. When two empty trailers are placed on a flat car the revenue would be $42.50 per car.

In outlining some of the reasons which impelled it to initiate the present proposal, respondent Great Western points to the decline in the volume of its less-carload traffic. The decrease in revenue on the less-carload traffic from the average of 1921-1925 was $1,445,051, or 70.4 per cent. At the time of the hearing the volume of less-carload traffic was about 15 per cent greater than in 1935.

A large volume of less-carload freight is assembled

by forwarding companies for movement from Chicago to Minneapolis. This movement ranges from 8 to 15 cars per day. The Great Western handles little, if any, of this traffic. The shipments of three forwarding companies move principally over the lines of the Chicago, Milwaukee, St. Paul & Pacific, the Chicago, Rock Island & Pacific, and, to a lesser extent, over the Chicago & North Western.

Following are some extracts from the report, by Commissioner Splawn, discussing the testimony and the legal points raised by protestants, and from the dissenting opinion by Commissioner Porter:

The Commission's Report

Respondent motor carriers particularly the Keeshin Company, have developed an average load of about 7.4 tons per trailer, on traffic transported by highway between Chicago and the Twin Cities. On that basis two vehicles, loaded on one flat car, would furnish average loading of approximately 14.8 tons per car, which is much better than the average loading of merchandise traffic in box cars. In this connection respondents refer to studies of the Coordinator which show the average load per car in 1932 as 3.14 tons in the western district and 3.63 tons for the United States.

At the time of the hearing from 8 to 10 loaded vehicles per day were moving over the highway from the Chicago terminal of the Keeshin Company, to its terminals in the Twin Cities. The tonnage moving southbound was about 80 percent of that handled northbound. Under respondents' proposal substantially all of this traffic would move by rail between these points.

The Great Western has attempted by various means to regain merchandise traffic formerly enjoyed, but prior to the inauguration of the service described in the related proceeding it did not meet with much success. It realizes that railroad operations are necessarily limited to tracks in fixed locations whereas trucks have a flexibility and mobility not possible in rail operation. The truck performs the gathering and distributing service for freight that originates in less-carload quantities at points not adjacent to and abutting upon railroad tracks, and in recent years there has developed an extensive service upon a dependable basis. Consequently trucks have become important carriers of the country's commerce.

The present traffic of the motor carrier with which the Great Western desires to establish joint service is drawn from what formerly constituted less-carload traffic at the railroads. The Great Western feels that if it is to recover some of this traffic it must participate in coordinated service with respect to which it performs the long-distance inter-city hauling and the motor carrier performs the service beyond the terminals. It initiated the proposed arrangement and anticipates that it will receive as its division of the gross revenue from a quarter of a million to a million dollars a year.

One of the advantages of the proposal stressed by respondents is that the removal of freight-carrying vehicles from congested trunk highways is in the interest of public safety, and will tend to reduce the cost of maintenance of those highways. It is argued that while the arrangement preserves all the advantages of serving the convenience and necessity of the public, it also tends to eliminate or reduce highway hazards.

Respondents further refer to our repeated statements that rail carriers should increase their earnings by means other than advancing rates. They argue that the present proposal, whereby through cooperation between motor and rail carriers a substantial volume of traffic now flowing over the highway will be moved by railroad without increasing the cost to the public, should meet our approval.

The Protests

The western trunk-line rail carriers were the only protestants offering evidence in opposition to the proposed rates. They are apprehensive of the effect which those rates will have on the all-rail rate structure if they become effective. They fear that when shippers are generally familiar with them and the character of the service which they cover they will be called upon to meet the competition by offering similar service at competitive rates or by making reductions in their all-rail rates, or failing to do so, suffer substantial losses of traffic, either of which would have an adverse effect upon their revenues.

Protestant rail carriers stressed the relative importance of the less-carload traffic which they are now handling. For example, in 1935 the revenue of the Chicago and North Western from this traffic was 11 percent of its total revenue. The decline in less-carload tonnage and revenue since the year 1932 has been relatively small. In 1935 some of the carriers reported increased earnings on this traffic. The evidence on the whole indicates reasonably stable revenue from that source in the past 4 years. It is urged, furthermore, by protestants that current statistics with respect to less-carload freight do not fully reflect the volume of such traffic moving all-rail, for the reason that a substantial volume of this tonnage now moves under all-freight rates or as pool-car traffic and is reported as miscellaneous carload freight.

The proposed rates do not extend to the territory west of Omaha and the Twin Cities, but protestants claim that the proposed joint rates to those points when used in combination with the rail rates beyond will disrupt the present all-rail adjustment.

Some of protestants' witnesses suggested that a better way for the Great Western to meet the competition of motor carriers would be to establish rates for all-rail service, including pickup and delivery, on the same basis as the motor rates. It is their opinion that such a plan would avoid the encouragement of motor competition, but it seems to be subject to the same objection that they make to the proposed adjustment, namely, that it is in effect making rail service available at the highway rates.

Protestant rail carriers have themselves made some very drastic rate reductions in an effort to cope with the motor competitive situation. These have secured additional traffic in some cases but in others they have had little or no effect, one of the difficulties being that motor carriers were not required to publish their interstate rates prior to April 1, 1936. While protestants believe that the publication of such rates has had a desirable effect, they are convinced that those rates will be more definitely stabilized when the requirements to be observed relating to hours of service, safety regulations and accounting practices have been prescribed.

Lawfulness of Proposed Rates. Sections 1 and 216 (c). With respect to the lawfulness of the proposed rates the primary questions for determination are whether those rates are reasonable and whether they would be compensatory. There is no suggestion that they exceed maximum reasonable rates, but protestant rail carriers contend they are unreasonably low.

The record contains little or no evidence as to average revenues and expenses in connection with motor vehicle operations, other than the average revenue of 62 cents per 100 pounds from recent operations between Chicago and the Twin Cities. Consolidated profit-and-loss statements of the Keeshin Motor Express Company, Inc., an Illinois corporation, and its subsidiary, Keeshin Motor Express, Incorporated, an Indiana corporation, for the years 1934 and 1935 were introduced at protestants' request. They show a net income from operations in 1934 of $512.46 and a net loss in 1935 of $4,532.49. From these statements protestants argue that the present all-highway rates are unreasonably low and that the proposed joint rates, being the same as those highway rates, are therefore also unreasonably low. This conclusion rests on numerous assumptions. For example, one is that the level of respondents' present all-highway rates between the particular points herein considered is the same as it was in 1934 and 1935, and that the results of all of the operations covered by the statements can be accepted as reflecting the situation as to the limited number of points within the scope of the instant proceeding. These assumptions have no basis in the record.

There are no adequate studies of the cost of highway transportation available in this proceeding. Further experience of motor carriers under a stabilized adjustment of rates for all-highway service and with joint motor-rail operations as they develop will afford opportunity to compile operating and revenue statistics relating to such matters. In the absence of such data at this time we can only rely upon such rate comparisons and other facts relating principally to rail operations as the record affords. In our opinion they do not indicate that the proposed rates are lower than minimum reasonable rates.

We find that the divisions of the rail carrier under the proposed rates will be compensatory. The question whether the agreed divisions of the proposed rates will be unjust, unreasonable, inequitable, or unduly preferential or prejudicial as between the respondents is not in issue in this proceeding.

Sections 2, 3, and 216 (d). Protestants allege that the proposed rates will result in unjust discrimination, undue preference, and undue prejudice in violation of sections 2, 3, and 216 (d).

The claim of discrimination is based on the fact that contemporaneously with its participation as an intermediate carrier in the proposed joint rates, the Great Western will maintain on a different basis its station-to-station all-rail rates with store-door pick-up and delivery service. This variation in rates between the charges for the two services which would obtain in the rates between the interchange points and also between certain other points on the Great Western in the proposed adjustment is claimed by protestants to constitute a violation of section 2. The two serv-

ices here considered are distinct. Either service would be available to anyone who might desire it. No shipper appeared in opposition to the proposed rates. In the circumstances we find that the proposed rates will not result in unjust discrimination.

Section 4. The present motor rates for highway service are generally lower than the rates for all-rail service. The proposed motor-rail-motor rates are the same as the rates of the motor carrier for highway service. The motor carrier does not serve many of the local points on the Great Western between Chicago and St. Paul, and no joint motor-rail-motor rates would be established from and to those points. At many of these intermediate points only ordinary all-rail service at rates higher than those for motor-rail-motor service from or to a more distant point would be available.

There are also situations where the proposed rates for joint motor-rail-motor service are higher for a shorter than for a longer distance involving like transportation. These may be illustrated by the proposed first-class rates of $1 from Chicago to St. Paul and 87 cents from Chicago via St. Paul to Eau Claire.

The question is whether the provisions of section 4 apply to the rates in these two types of situations. In the event that we so conclude the Great Western, by fourth-section application No. 16333, asks authority to establish and maintain them without observing those provisions.

The record shows that the proposed motor-rail-motor service differs substantially from all-rail service. The rail carrier's part in the joint service is merely the hauling of the loaded trailers containing the shipments. This is a concentrated operation, in some respects resembling the handling of carload shipments. Many costly operations incident to movement of less-carload merchandise traffic in all-rail service are avoided. For example, much of the handling of the shipments which takes place in all-rail service of similar scope is avoided by the rail carrier under the proposed arrangement. The part of the joint service rendered by the motor carrier is substantially the same as the corresponding operations which are performed in all-highway service. In these circumstances we cannot conclude that the proposed joint service and the all-rail service are like kinds of service.

We find that the rates in situations such as those here considered are not applicable on "like kind of property" and that they would not be in contravention of section 4. This finding is not to be construed as having application to situations in which rail carriers, by the mere expedient of joining with motor carriers performing pick-up-and-delivery service at one point and not at another would thereby seek to escape the provisions of section 4.

Applicant will be authorized to join with respondent motor carriers in establishing and maintaining rates on the bases described herein and to establish and maintain higher rates from and to intermediate points constructed on the same basis, provided that rates from and to the higher-rated intermediate points shall not be increased without authority of the Commission and shall not exceed the lowest combination of rates subject to the act.

In General. Protesting rail carriers challenge the legality of the proposed arrangement in that it will enable the Great Western to invade the local territory of competing railroads without first securing a certificate of public convenience and necessity. These rail protestants contend that the right to local territory is guaranteed by section 15 (4), or at least in reliance upon that section large investments have been made by western carriers in building branch lines and in acquiring short ones. They urge that public interest and carrier interest do not demand or justify through routes and joint rates between motor and rail carriers except to or from non-railroad points or where truck service is used as an auxiliary to rail service in lieu of engines and cars.

No requirement of a certificate of convenience and necessity is imposed in connection with section 216 (c). As that section specifically authorizes rail carriers and motor carriers to establish through routes and joint rates, it is reasonable to conclude that it was not intended that carriers should be required to obtain such certificate when the proposed through service would be over lines or routes of the respective participating carriers which are in lawful operation.

Conclusions

The record upon which we base our conclusions on the various issues considered herein is not as definite or complete as is desirable. To a large extent this is necessarily so because of the novel character of the proposed rates and service and the lack of experience therewith. The service appears to have advantages for both carriers and shippers, particularly with respect to those situations in which the part of the service to be rendered by the motor carrier is that for which it is peculiarly fitted and to the extent that the plan affords the rail carrier an opportunity to participate in traffic which would otherwise move by highway. The evidence at hand indicates with reasonable probability that most of the service under the proposed arrangement would be of that character.

While it is our duty to determine whether or not the rates and charges for the proposed service would be unlawful, we may not withhold our approval of the arrangement because the pattern for the proposed rates is the existing adjustment maintained by the respondent motor carriers instead of the all-rail adjustment. Nor may we condemn the plan of joint operation merely because it differs in some essential respects from existing methods of transportation or because experience may demonstrate that certain phases of that operation are not profitable. However, nothing herein shall be construed as approving the operation of respondent motor carriers over the routes herein involved.

PORTER, COMMISSIONER, dissenting:

We have here no *bona fide* joint arrangement under which individual shipments will be transported partly by the motor carrier and partly by the rail carrier. Neither the shipper nor the rail carrier will know whether any particular lot of goods is or is not transported by rail. I am convinced that the proposed arrangement is in substance nothing but a contract between two carriers under which the rail line agrees to transport for the motor line—not for the shipper.

In *Pick-up and Delivery in Official Territory*, 218 I. C. C. 441, we held that where line-haul transportation is wholly by rail and where the latter carrier engages a motor carrier or carriers to perform for it pick-up or delivery service, which service is included in the rail rates, the transportation is performed under part I of the act, and the motor carrier is not a party to a joint motor-rail rate made by authority of part II. Here the majority proposes to establish under part II purported "joint" rail-motor rates for the same kind of service we held was not subject to part II. Motor carriers have challenged in the courts our finding in the *Pick-up and Delivery case*, on this very ground. The majority report in effect confesses that our finding in the *Pick-up case* was not in accordance with law.

Nor can I agree with the majority that the proposed arrangement is in the public interest. The record makes it clear that there are only two reasons behind the proposed arrangement; first, that the compensation which the rail carrier has agreed to accept for hauling the trailers loaded or empty is less than the out-of-pocket cost of handling the same trailers between the same points by highway, and second, that the low charge of the rail carrier will thus be available only to motor carriers of its own selection and not to other motor carriers or to shippers, whether they be freight forwarders or others. It is not proposed by the motor carrier to pass on to shippers any of the benefits accruing to it as a result of the cheap transportation to be performed for it by the rail carrier. It follows that for the present the principal effect will be to swell the profits of the motor carrier. But as a result of the greater profit, it will become free to make reductions in the rates actually offered to shippers, thus building up its traffic and earnings at the expense of the railroads and other motor carriers. Arrangements such as here proposed may obviously be established only between large points. The inevitable result will be still further to build up large centers at the expense of the smaller towns and communities; to build up large motor carriers at the expense of small, because the latter will not be able to wrest from rail carriers arrangements as favorable as that here proposed, and to injure the railroads in general because the already diminished volume of less-carload traffic left to them will be still further diminished and at the same time they will be unable to abolish their freight stations or relieve themselves of much of the expense incident to less-carload transportation, thus increasing their unit cost of transporting less-than-carload freight to the smaller towns which will not be afforded the proposed service, with consequent possible increases in the rates thereto. The railroads there will be left to handle between the larger points merchandise only in trailer units for which they will be forced to accept such compensation as the large and powerful motor carriers will be willing to pay, and in addition they will be forced to incur the expense of providing additional flat cars while leaving their box cars idle.

In my opinion the arrangement is not in the public interest and will be in violation of sections 1, 2, 3, 4, 6, 7, 20, and 216 (c) and (d) of the act.

I am authorized to state that COMMISSIONER MCMANAMY concurs in this dissent.

Motor Carrier Cases before I.C.C.

Testimony as to the hours of service of bus employees, on the basis of which the Interstate Commerce Com-

mission is expected to issue regulations establishing reasonable requirement, under the authority of Section 204 of the motor carrier act, was presented at a hearing begun on November 19 before Examiners Snow and Kephart. Further hearings are to be held as to the hours of truck employees, probably beginning in January. At the initial hearing representatives of bus companies testified, giving voluminous statistics to show that bus drivers normally work from 9 to 10½ hours but that there is no direct relation between the number of hours worked and the frequency of accidents because the majority of accidents occurred during the early hours on duty. Arthur T. Warner, general manager of the Public Service Co-ordinated Transport and the Public Service Interstate Transportation Company, whose operations cover a large part of New Jersey and adjacent districts in New York and Pennsylvania, testified that the regular working run for its drivers was nine hours a day under an agreement prescribing the percentages of cases in which the work shall be completed within a specified spread of hours. More than 70 per cent of the runs, he said, were finished in less than 10½ hours. Marcus Dow, director of personnel and safety of the Greyhound Lines, produced accident statistics for the first ten months of 1936 covering the area east of the Mississippi river and north of the Ohio, showing that accidents were more frequent during the early hours at the wheel than they were after eight or nine hours, and similar testimony was given by other representatives of bus companies.

Without having reached a decision as to applicant's rights under the "grandfather clause," because of alleged operation prior to June 1, 1935, Division 5 of the Interstate Commerce Commission on November 17 issued a report and order denying to Robert Cullen Cosby, doing business as the W. G. Cosby Transfer, a certificate of public convenience and necessity authorizing operation as a common carrier of commodities generally from Richmond, Va., to destinations in various states and the District of Columbia, over irregular routes. The testimony at the hearing showed that the applicant had made only occasional trips to points without the state of Virginia and that his long distance hauling had consisted almost wholly of transportation of household goods, while protestants submitted evidence that the territory was served by numerous motor, rail, and water carriers, arguing that there was no public need for the service proposed. On the application for a certificate under the grandfather clause applicant had testified that the operations proposed had been carried on continuously since 1914. The granting of the certificate was opposed by the Middle Atlantic States Motor Conference, Inc., and by southern and trunk line railroads.

The trustees of the Chicago, Milwaukee, St. Paul & Pacific have filed with the Interstate Commerce Commission a statement of exceptions to the proposed report of Examiner Robert R. Hendon, of the Bureau of Motor Carriers, dated October 31, in which he recommended that the commission authorize the acquisition by the Union Pacific, the Chicago, Burlington & Quincy, and the Chicago & North Western of control of the Union Transfer Company by purchase of its capital stock. The Milwaukee statement takes exception among other things to the conclusion of the examiner that carriers are authorized by the terms of the motor carrier act to jointly acquire ownership and control of a motor carrier and asserts that to grant the application of the three roads would result in undue restraint of competition.

The first decision of the commission under its regulations as to insurance protection required of motor carriers was rendered by Division 5 on November 16, denying an application of the H. B. Church Truck Service Company for approval of its qualifications as a self-insurer under the provisions of Section 215 of the motor carrier act. The commissioners found that applicant's financial condition was not such as to satisfy them of its ability to borrow readily and safely to meet all liability obligations which might arise and that the principal insurance held by applicant was in a company legally authorized to transact business only in Massachusetts. While the self-insurance would relate chiefly to operations outside of Massachusetts which are now small in volume, they said that there is no assurance that they will not expand nor that they might not give rise to bodily injury and property damage obligations very materially in excess of past experience.

Joint Board No. 69, appointed by the Interstate Commerce Commission, has recommended in a proposed report that the commission issue a certificate entitling the Maine Central Transportation Company to continue as a common carrier by motor vehicle of passengers, baggage, light express, mail, and newspapers in the state of Maine, over regular routes, and special or charter operations to any point in New England and Washington, D. C., by reason of bona fide operations by the company or its predecessor in interest, on June 1, 1935, and continuously since that date. The board found, however, that bona fide operation between Portland, Me., and Boston, Mass., had not been shown.

A three-judge statutory court, sitting in the federal court for the District of Columbia, on November 24 rendered its decision declining to issue an interlocutory injunction sought by the American Trucking Associations, Inc., against the storedoor pick-up and delivery plan of the eastern railroads which was put into effect on November 16 in accordance with the decision of the Interstate Commerce Commission on October 30. A preliminary restraining order had been denied by the court on November 14. The trucking association had sought orders to prevent the roads from making the plan effective and the commission from accepting the tariffs.

The Interstate Commerce Commission has re-opened for further hearing the proceedings on the applications of the Pennsylvania Transfer Company of Pittsburgh for authority for the acquisition of the Alko Express Lines and of Scott Brothers, Inc., for authority for the acquisition of control of the W. G. Corporation.

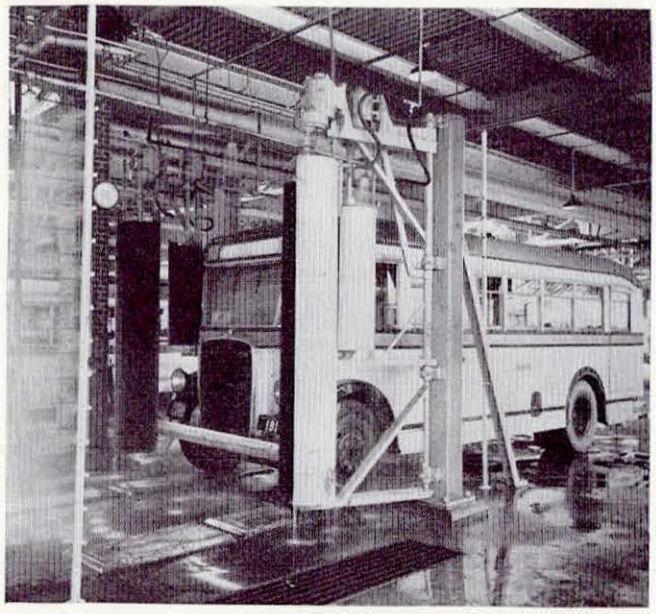
New Bus Washing Device

ROSS & White Company, Chicago, have developed a bus washing machine that is in satisfactory use by several bus companies. This machine consists of equipment operating simultaneously on each side of the vehicle. Each unit is equipped with two revolving brushes, 15 in. in diameter, the longer brush on each side scrubbing the vehicle from the bottom of the side to the top with the brush revolving in one direction, and the second brush giving the windows a second scrubbing but revolving in the opposite direction, so as to get the bristles of the brush well into the corners of each side of the windows. Perforated spray pipes are attached to the brush structure and thoroughly drench the brushes with water in the revolving process, washing out the dirt.

The brush supports are mounted on a vertical shaft bolted to the structure through four, self-oiling, rigid pillow blocks. This method of shaft and sleeve construction permits the brushes to aline themselves against

the side of the bus or car in the event it is on an incline or listed in one direction. The design also permits a permanently inclined position of the brushes when necessary for washing an inclined side surface of the vehicle.

The washer provides a minute adjustment when washing buses of varying widths. The brushes may be placed in any position desired and are held by a locking pin. This can be adjusted instantly by hand. When the brushes are locked in their proper washing position,



The Ross & White Bus Washer Operates by Electric Eye

the movement of the horizontal beam supporting the brushes works against Gibson compression springs that are easily adjustable to the pressure desired. The brushes can thus be kept at all times in the proper position with relation to the side of the vehicle to be washed; and can be changed in a few seconds if a narrower or wider vehicle next comes into the washer for cleaning, and also compensate for the gradual wear occasioned in the brush bristles.

The machines are operated automatically by General Electric Company "Electric eyes." The photo electric relays and light source provide a beam of light across the path of the incoming bus and, when this is broken, the motors start. When the bus leaves the washer, it crosses and breaks another light beam which stops the motors of the washing machine.

Monon Reorganization Plan

(*Continued from page 798*)

would carry a dividend rate of four per cent, non-cumulative.

Holders of present Indianapolis & Louisville first 4s and the Monon's three series of refunding mortgage bonds, totaling $14,998,000, would receive 25 per cent new series "B" first mortgage bonds and 75 per cent second mortgage contingent interest 3s. Past due interest, accrued at three per cent, would be paid in income debentures.

Present first and general mortgage bondholders would receive preferred stock par for par with accrued interest paid in income debentures. Each present preferred share would be exchanged for two new shares of common while the present common would be exchanged share for share.

Notes held by the Chase National Bank and the Railroad Credit Corporation in the principal amounts of $750,000 and $1,649,913, respectively. would be paid in new four per cent contingent interest 10-year notes, dated July 1, 1936. Overdue accrued interest, calculated at a maximum rate of three per cent, would be paid in new preferred stock. Notes held by the Louisville & Nashville and the Southern, totaling $585,180 each, would receive 100 per cent in common with 58 per cent of the $267,000 accrued interest in common stock.

Under the plan the Louisville & Nashville and the Southern, at present jointly owning control of the Monon through ownership of 77 per cent of the present preferred and 93 per cent of the present common, would retain control, receiving, under exchange terms, approximately 201,000 of the 234,420 common shares to be issued.

Odds and Ends . . .

Vimy Pilgrimage

There are few events in which some American railroader is not concerned. The pilgrimage to Vimy ridge in France last summer by the Canadian veterans of that battle found George Payne, assistant engineer, Missouri Pacific, among them. Payne, though born in the United States, went over with the Canadians early in 1916.

Advertising Pays

An advertisement that still had pulling power 50 years after its original issuance was discovered by the Illinois Central at Freeport, Ill., when the office was besieged by more than 40 men, many with teams, looking for work on the "Chicago, Madison & Northern Railway" at $3.50 per day for man and team for 10 hours' work, payable monthly. The response was finally traced to the fact that the Freeport Journal-Standard the day before had published, in its "Fifty Years Ago" column, an advertisement originally published by the predecessor line of the Illinois Central in that vicinity.

Missouri Pacific Presidents

The Missouri Pacific claims, among its present officers, an unusually large percentage of men who have headed and are heading national organizations. L. W. Baldwin, president of the railroad, and H. R. Safford, executive assistant, are both past presidents of the American Railway Engineering Association, and Mr. Safford is also past president of the National Council of the United States Chamber of Commerce. J. Cannon, chief operating officer, is chairman of the general committee, Operating division of the A.A.R. R. S. Mitchell, chief special agent, was the first president of the Protective section of the A.A.R. J. L. Fisk, general agent, passenger department, is a past president of the Traveling Passenger Agents Association. A. D. Bell, assistant passenger traffic manager, is past president of the American Association of Passenger Traffic Officers. E. H. McReynolds, director of publicity, is president of the Advertising Federation of America. P. M. Gault, signal engineer, is past chairman of the Signal section, A.A.R. John T. Stinson, director of agricultural development, is past president of the American Railway Development Association. C. F. Larson, superintendent of safety, is past chairman of the Safety section, A.A.R., and past general chairman of the Steam Railroad section of the National Safety Council. S. O. Taylor, master car builder, is past chairman of the Master Car Builders Association. R. J. Maxwell, manager of advertising, is past president of the Association of Railway Advertising Agents, and C. G. Burke, associate editor of the M. P. magazine, is president of the Railway Magazine Editors Association.

NEWS

Settle Strike of L. & A. Train Service Employees

Agreement is reached at meetings called by Governor Leche of Louisiana

A strike of enginemen, firemen, conductors and trainmen called by the Big Four brotherhoods on the Louisiana & Arkansas on September 19 was ended on November 20 when differences were settled by agreements reached at meetings called by Governor Richard W. Leche, of Louisiana. During the strike, the most serious occurring on railroads in several years, six men were killed in wrecks and one was shot to death, while a number of persons were injured and several bridges were burned. On November 18, near Minden, La., a fireman and conductor were injured when the locomotive struck a "cocked" switch at Hortman's spur and overturned. Six cars were derailed, several of them turning over. Immediately before the derailment, the headlight on the engine was shot out by a sniper.

The strike was called to force the railroad to reinstate agreements abrogated in June, 1933, recognizing standard rates of pay, rules and working conditions. Immediately following the walkout, employees and others appealed to the President, the Secretary of Labor, and the National Mediation Board for action to terminate the strike. The National Mediation Board, on September 23, sent a telegram to C. P. Couch, president of the railroad, and the employee representatives, suggesting that they endeavor to compose their differences in joint conference, with the understanding that if they were unable to do so the chairman of the mediation board would go to Shreveport to be of such help as might be possible in settling the strike.

In a later report Chairman Carmalt said, "The employee representatives advised that they had been and were then ready to meet President Couch with or without the presence of a representative of the board. President Couch was not agreeable to meeting the employee representatives in joint conference. The questions in dispute are of a nature in which all of the transportation employees have a common interest and the railway labor act assures the employees the right to select their representatives without interference or coercion by management. Among these questions is the general refusal of the management to comply with awards of the National Railroad Adjustment Board in accordance with the railway labor act. President Couch's insistence that he meet representatives of each craft separately is not supported by the railway labor act and is the primary obstacle to a settlement of the present strike. The recommendations of three emergency boards appointed, one by President Hoover and two by President Roosevelt, have been flouted by the management and President Couch persistently refuses to follow the processes laid down in the railway labor act. Because of this attitude of the management our board can be of no service unless and until President Couch is brought to agree to conduct his relations with his employees in accordance with the railway labor act, as do all other railroads in the United States."

Following the violences resulting in damage to persons and property, Governor Leche called a conference with the railroad's president and the representatives of the brotherhoods on November 12. As a result of this and subsequent meetings on November 13, 18 and 19, an agreement was reached and the 300 striking employees returned to work. The conferees included: Governor Leche; C. P. Couch, president, and Harvey C. Couch, chairman of the board of the Louisiana & Arkansas; O. K. Hedges, of the Brotherhood of Locomotive Engineers; Fred Barr, of the Brotherhood of Locomotive Firemen and Enginemen; C. H. Smith, of the Brotherhood of Railway Trainmen; W. L. Carter, of the Order of Railroad Conductors; B. W. Cason, state commissioner of labor; Attorney General Gaston L. Porterie, and George M. Wallace, executive counsel to the governor.

Broadway Limited to Leave Chicago at Four O'Clock

The city of Chicago having resumed the use of Central time as its standard, the Pennsylvania announces that the eastbound Broadway Limited will, beginning November 29, leave Chicago at 4 p. m. instead of 3:30 as at present. The running time through to New York will continue 16 hr. 30 minutes.

Railroad Enthusiasts to Inspect Jersey Central Facilities

Facilities of the Central of New Jersey in the New York area will be inspected on Saturday, December 5, by members of the New York division, Railroad Enthusiasts, Inc. The railroad has arranged for a special train to take the party with guides on the tour which will include the Communipaw (N. J.) roundhouse, where various types of motive power will be displayed, and the Elizabethport shops. Following this inspection, the group will proceed to Eddystone, Pa., to view the locomotives under construction at the plant of the Baldwin Locomotive Works.

Lists Factors Affecting Roads' Immediate Future

Pelley statement addressed to "those whose interest in railroads is more than casual"

J. J. Pelley, president of the Association of American Railroads, has issued a statement addressed to "those whose interest in railroads is more than casual," summing up several factors which will have important effects on the immediate future of the railroad industry as follows:

1. With reviving volume of business, handled at present rates and at present high efficiency, the railroads are bettering their net earnings—which, however, still average less than two and one-half per cent on their property investment.

2. The emergency charges authorized by the Interstate Commerce Commission in 1935 will expire on December 31, 1936. During the first eight months of 1936, these charges produced about $77,000,000 revenue to the railroads. Without this revenue, the railroads would have failed to earn their fixed charges during those months by approximately $60,000,000. The railroads do not intend, however, to ask for the further indefinite extension of these charges in their present form, but are asking the Commission for permission to make a revision and readjustment in the rate structure, to become effective when the emergency charges expire, which will meet present-day conditions of competition and offset in part the revenue losses which will result from their expiration. The general level of rates, should the Commission approve the proposed readjustment, will be somewhat lower than that now in effect. The proposed readjustment will include, also, important steps toward uniformity of rates in the various rate territories and greater simplicity in the tariffs in which rates are published. The decision on these proposals will be of the utmost importance in the immediate future of the railroads.

3. At the session of the new Congress beginning in January, 1937, it is expected that consideration will be given to a number of bills affecting railroads, which will also be of interest to business in general.

Among these are:

THE REGULATION OF DOMESTIC WATER CARRIERS. At the session of the recent Congress, a bill to regulate water carriers for hire engaged in domestic commerce was favorably reported by the Senate committee. The same, or a similar bill, will doubtless be before the next Congress. Such legislation as is proposed will not deal with foreign commerce but only with

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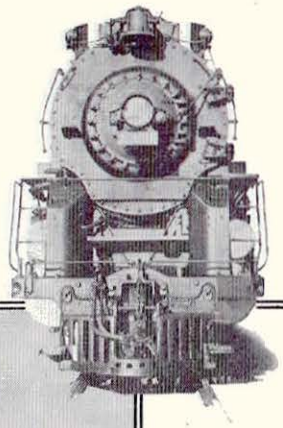
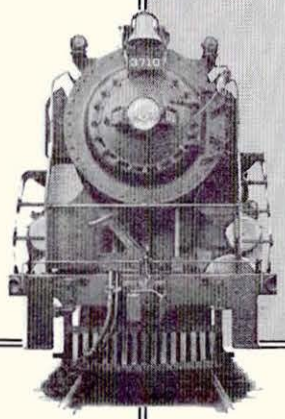
MODERN LOCOMOTIVES MEAN . . .



- Increased power at high speeds
- Fuel economy
- Lower maintenance
- Higher operating standards
- Greater gross earnings
- Increased net profits



LIMA LOCOMOTIVE WORKS LIMA LOCOMOTIVE WORKS INCORPORATED INCORPORATED, LIMA, OHIO

domestic commerce for hire. Its purpose is to insure proper regulation, stability and publicity of water rates. It is far more than a device to equalize competitive conditions between water and rail carriers. It is a sound move toward stabilizing the transportation relations of all business, a move favored not only by railroads but by responsible shippers and water line operators.

REPEAL OF THE LONG-AND-SHORT-HAUL CLAUSE. At the last session of Congress, a bill to repeal this portion of the Interstate Commerce Act passed the House of Representatives by an overwhelming majority but was not brought up in the Senate. Enactment of such a bill would mark the first important step in nearly fifty years toward relaxing the restrictions on railroads. The relaxation would not, as is said by opponents of the measure, enlarge the opportunities of railroads to *raise* rates. It would enlarge their opportunities to *reduce* particular rates to meet competition in those cases where such reductions would secure *enough additional business to increase the net revenue* of the railroads. It would enable railroads to recover business now almost monopolized by other forms of transportation, at rates somewhat lower than the present rates but still high enough to cover the small added cost of additional service with some profit besides. It would not relax any of the safeguards of the Interstate Commerce Act. Every essential power of the Commission and every public value of regulation would be preserved in full force and vigor. Railroads would be given more freedom to apply business methods to the recovery of traffic, the enlargement of the volume of their business, the improvement of their services, and the increase of their net revenue.

BILLS TO INCREASE RAILROAD OPERATING COSTS. Legislation proposed in the last Congress included such measures as the six-hour-day bill, the so-called "full crew" bill, the train limit bill, and other measures which, if enacted, would have the effect of increasing railroad costs of operation without increasing their revenues, improving their service or adding to their safety. It is expected that similar legislation will be proposed in the next Congress.

New York-Augusta Service Expedited

The Southern on December 6 will reduce the running time on its Aiken-Augusta Special which operates between New York and Aiken, S. C., and Augusta, Ga. Under the new schedule the running time between New York and these resorts will be shortened by one hour while the northbound schedule will be cut by 1 hr. 30 min.

History of Texas Published by Katy

Texas, Its History and Its Heroes, is the title of a booklet published by the Missouri-Kansas-Texas in observance of the centennial of Texas independence. Among the heroes mentioned are: Stephen F. Austin, Sam Houston, William B. Travis, James Bowie, David Crockett, James B. Bonham and James W. Fannin. Two pages in the book are devoted to pictures of lounge and dining cars on the Katy, while a third shows the importance of the railroad to the state.

Traffic Club of Dallas Elects Officers

The Traffic Club of Dallas has elected the following officers for the ensuing year: President, S. D. Sparkes, freight traffic manager of the Missouri-Kansas-Texas; first vice-president, J. M. Cody, traffic manager of Butler Brothers; second vice-president, W. M. Vaughn, commercial agent of the Southern Steamship Company; third vice-president, C. R. Gartrell, traffic manager of the Continental Supply Company; and secretary-treasurer, George Adamcik, freight representative of the Northern Pacific.

Holiday Tickets on Sale December 1

Western railroads have advanced the date of sale for holiday bargain rail tickets from December 15 to December 1, the advancement being prompted by a marked expression throughout the West on the part of travelers for an earlier leaving time. These excursion rates for first class will be on a basis of a fare and one-third of the basic three-cents-a-mile charge, while for coach travel the rates will be based on a fare and one-half of the basic charge of two cents a mile. All tickets will carry 30-day return limits. Present indications point to a heavy movement of holiday and winter vacation travelers.

Denver Zephyr in Accident

Damage estimated at $20,000 was sustained by the Denver Zephyr of the Chicago, Burlington & Quincy on November 19, when it was sideswiped by a Denver & Rio Grande Western passenger train in the Denver terminal. No one was hurt. The car hit was a sleeping car behind the dining car, and it and the four cars following were derailed. The remainder of the train, after a short delay, continued the eastbound run and picked up two sleepers from the westbound section at Omaha. About two weeks will be required to repair the cars, and, in the meantime, the Denver Zephyrs will operate with two sleepers apiece instead of four.

According to preliminary investigations, the Zephyr and the D. & R. G. W. passenger train bound for Salt Lake City by way of the Moffat tunnel, were proceeding on parallel tracks, having left the station at about the same time. Both trains were traveling at less than 15 miles an hour, in conformity with the yard rules. According to the engineman of the D. & R. G. W. train, his signals were clear. It developed, however, that as the D. & R. G. W. train reached a crossover, the switch apparently was open and the train headed into the side of the Zephyr. This impact caused the rear trucks of the coach to start down another set of tracks, pulling four other cars. The derailment followed. Passengers in the cars were only slightly shaken and no damage was done inside the cars.

Revision of Rates to Albany Prescribed

A revision of the freight rates on import, export, coastwise, and intercoastal traffic between the port of Albany, N. Y., and points in central territory, western trunk line territory, and a portion of trunk line territory was prescribed by the Interstate Commerce Commission in a report and order made public on November 24 on a complaint filed by the Albany Port District Commission, finding the present rates to be unreasonable and unduly prejudicial of competing ports. Between Albany and all points in central and western trunk line territories the prescribed rates give Albany a parity with Philadelphia, with differentials of 1 cent over Baltimore and 2 cents under New York, except where the domestic rates to Albany are lower. The exception would apply at most points in the northern part of central territory. The failure of the New York Central system lines to absorb wharfage and handling charges at the port of Albany to the same extent that they contemporaneously absorb such charges at Boston was found unduly prejudicial to Albany. Commissioners Mahaffie and Miller dissented in part.

Kansas City Ticket Offices Moved

The ticket offices of the Union Pacific, the Chicago, Burlington & Quincy, the Missouri-Kansas-Texas, the Wabash, the Missouri Pacific, the Chicago, Rock Island & Pacific, the Chicago, Milwaukee, St. Paul & Pacific and the Alton, now located in the Railway Exchange building in Kansas City, Mo., will be moved on January 1, 1937, to Eleventh and Grand avenue, where they will be housed in a newly constructed building. The new building, in which each railroad has separate space, is located closer to the business district and is more convenient to the traveling public.

Eight Roads Move to New Kansas City Ticket Office

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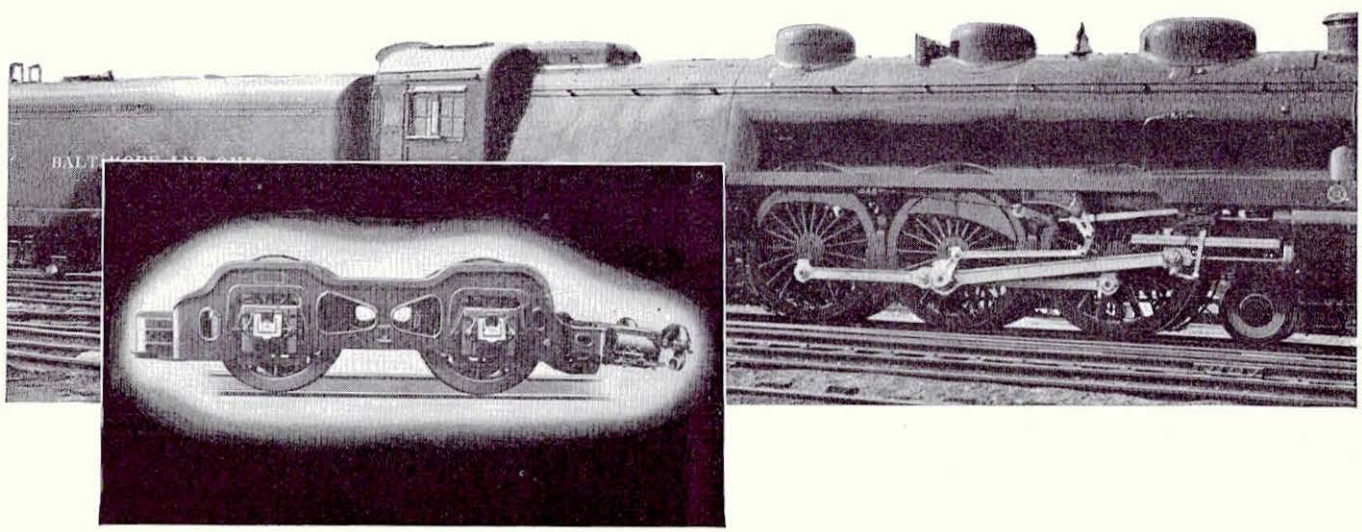
FOR MAXIMUM ECONOMY AND EFFECTIVENESS

The Locomotive Booster is Essential



The Locomotive Booster is an integral part of any locomotive design, which enables maximum road capacity without the necessity of carrying and maintaining an excess of dead weight. It capitalizes idle weight and spare steam by using it to provide additional tractive effort for starting, accelerating and over the "tight places."

This added tractive effort of The Booster permits smaller main cylinders and lower piston thrusts. It reduces the stresses throughout motion work and frames. The result is a locomotive that costs much less to maintain and operate.

Specify Franklin Replacement Parts for Franklin Devices.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

The offices of the Atchison, Topeka & Santa Fe and the St. Louis-San Francisco, also located in the Railway Exchange building, have already been moved to the Fairfax building, where each railroad maintains its own office.

Club Meetings

The Toronto (Ont.) Railway Club will hold its sixth annual dinner at the Royal York Hotel, in Toronto, on Saturday evening, December 5. The guest speaker will be Hon. G. H. Ferguson, formerly Prime Minister of Ontario. There will be no other meeting of the club in December.

The Northwest Carmen's Association (St. Paul) will hold its next meeting on Monday evening, December 7, at the Midway Club Rooms, 1957 University Avenue, St. Paul. J. T. Clark, of the Vapor Car Heating & Lighting Company, will speak on passenger train steam heating equipment.

Oregon Grain Shipping Favored in Decision

A decision in favor of the Farmers' National Grain Corporation was handed down by the federal district court at Portland, Oregon, on November 17, in a suit in which the Oregon-Washington Railroad & Navigation Company sought to collect $17,782, plus interest, the difference between interstate charges and those which would accrue on similar intrastate shipments. The railroad contended that wheat shipped by the corporation from the interior of Oregon to terminal No. 4 in Portland, over this railroad, at various times during the past several years, should be paid for on the basis of interstate rates, which are higher, since the corporation contemplated that the grain would be sent into interstate or foreign commerce after reaching Portland. A total of 668 cars of wheat, having a total weight of 59,607,627 lb., were involved. The court ruled that the intrastate rates should prevail.

Pullman to Begin National Advertising Campaign

The Pullman Company, next year, will conduct a national consumer advertising campaign to sell the public on Pullman comfort, convenience, safety and service. This 1937 campaign will follow that of this year, during which the company has run advertising in newspapers and magazines to announce the removal of the surcharge in the eastern territory and extensive room-rate reductions for single occupancy. Next year's advertising will appear in an extensive list of national magazines and business papers, including four national weeklies and a number of general and women's national magazines. A small supplementary campaign is scheduled for a list of teachers' publications. Twelve or more railroad publications will be used in a campaign to make consumer advertising familiar to railroad and Pullman employees.

Pennsylvania Limited Celebrates Fifty-fifth Birthday

The Pennsylvania Limited, the "world's first train to be designated as a 'limited'," has just celebrated its fifty-fifth birthday. It was inaugurated November 19, 1881, under the name of the New York and Chicago Limited and made the westbound run in 26 hr. 36 min. and the eastbound run in 26 hr. 4 min. These were very fast schedules for the period. The name was changed to The Pennsylvania Limited in September 1891. The train has been operated continuously without missing a single trip since its inaugural run. It now goes through in 18¾ hours.

Pennsylvania passenger department officials estimate that the train has carried at least 7,000,000 passengers and has covered more than 36,000,000 miles.

In its first year of service the train was composed entirely of "Pullman Palace" cars. Through passengers were accommodated in "hotel" cars. These, in addition to the regular berths and drawing-rooms, had good sized kitchens from which table d'hote and a la carte meals were served. In 1882 dining-cars were added, and the hotel cars were discontinued. An observation car was added in 1889.

Originally painted a dark olive, the exteriors were changed in January, 1898, to a striking combination of jade green below the window sills and cream above that line. In the fall of 1902 the Pennsylvania's standard Tuscan red was adopted and has been continued since. The Pennsylvania Limited has the distinction of being the first train in America or Europe to be lighted by electricity.

I. C. C. to Investigate Class Rates in Southern Territory

The Interstate Commerce Commission announced on November 20 that it had decided to grant the request for an investigation of the class rate structure in southern territory made in petitions filed with the commission by the Joint Conference of Southern State Commissioners and Shippers, the state regulatory commissions of various southern states, the Southern Traffic League, the North Carolina Traffic League, the South Side Virginia Just Freight Rate Association, and certain other commercial organizations and shippers, alleging that the present rates are unjust and unreasonable.

The commission is prepared to enter an order instituting an investigation into the reasonableness of class rates within southern territory, to be defined as including the region bounded on the north by the line of the Norfolk & Western between Norfolk, Va., and Kenova, W. Va., and the Ohio river between Kenova and Cairo, Ill., and on the west by the Mississippi river between Cairo and the Gulf of Mexico, excluding rates between local points on the line of the Chesapeake & Ohio in Kentucky, and including rates between southern territory, on the one hand, and northbank Ohio river crossings, the so-called southern Ohio group, and Helena, Ark., on the other hand. Such an investigation would be confined to class rates within southern territory, without including any interterritorial rates to or from such territory, and the issue would be limited to the matter of lawfulness under section 1 of the interstate commerce act.

"It is the belief of the commission," however, according to a notice issued by Secretary McGinty, "that, if such an investigation is instituted, requests will probably be made at once that it be broadened to include various related interterritorial rates, and perhaps that the issues be broadened also. It seems desirable that such matters be given consideration before the investigation is instituted rather than afterward."

Therefore, the commission will receive, on or before December 12, communications with respect to the proposed investigation, either asking that it be broadened, stating explicitly what broadening is desired and why, or giving reasons why it should not be broadened but confined within the limits above indicated.

Steam Railway Accident Statistics

The Interstate Commerce Commission completed statistics of steam railway accidents for the month of August, 1936, now in preparation for the printer, will show:

Item	Month of August 1936	Month of August 1935	8 months ended with August 1936	8 months ended with August 1935
Number of train accidents	625	487	5,494	4,213
Number of casualties in train, train-service and non-train accidents:				
Trespassers:				
Killed	314	340	1,843	1,872
Injured	309	367	1,906	2,167
Passengers on trains:				
(a) In train accidents:*				
Killed	....	....	6	....
Injured	10	2	497	300
(b) In train-service accidents:				
Killed	1	1	4	13
Injured	156	176	1,146	1,000
Travelers not on trains:				
Killed	....	....	11	6
Injured	65	49	517	402
Employees on duty:				
Killed	55	50	428	362
Injured	1,879	1,391	14,166	10,536
All other nontrespassers:†				
Killed	140	138	1,137	1,049
Injured	504	384	4,168	3,674
Total—All classes of persons:				
Killed	510	529	3,429	3,302
Injured	2,923	2,369	22,400	18,079

* Train accidents are distinguished from train-service accidents by the fact that the former cause damage of more than $150 to railway property.

† Casualties to "Other nontrespassers" happen chiefly at highway grade crossings. Total highway grade-crossing casualties *for all classes of persons, including both trespassers and nontrespassers*, were as follows:

Number of accidents	273	248	2,483	2,291
Persons:				
Killed	118	130	1,027	983
Injured	308	246	2,883	2,695

R. & L. Historical Society

The Railway & Historical Locomotive Society (Boston) has issued its bulletin No. 41, dated November, 1936. This is an illustrated pamphlet of 56 pages, and contains an interesting batch of miscellany on railroad history. The first article is on the New York & Pennsylvania Railway, a 57-mile line from Canisteo, N. Y., through Oswego and Millport, Pa., to Ceres, N. Y., which, for lack of business and because of severe damage by floods, discontinued operations in July, 1935.

Mr. Fisher, president of the society, contributes an article on William Mason's work in developing the Fairlie locomotive, in the years following the Civil War. Other articles deal with locomotives of the New York, New Haven & Hartford, the

Continued on next left-hand page

SECURITY ARCH BRICK

is better

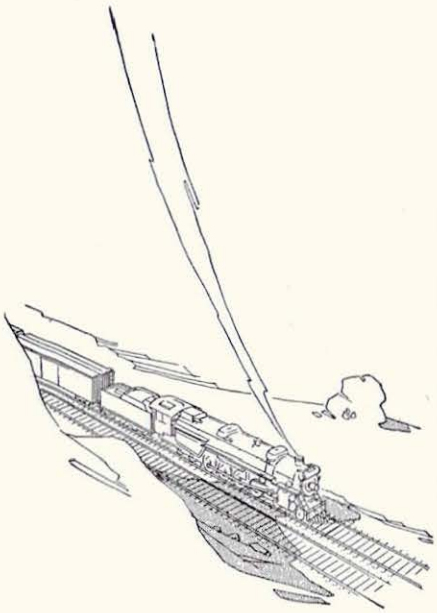
Security Arch Brick quality is vastly improved over the brick of a decade ago.

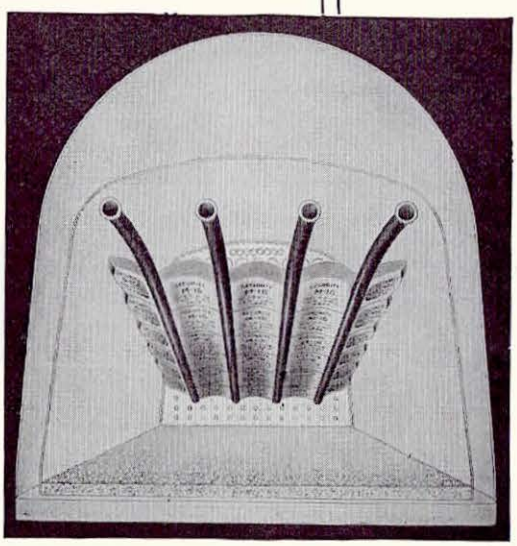
Constant study of refractories and manufacturing methods makes it so.

Security Arch Brick of today is giving far greater service and greatly increased returns.

Measure its performance by the number of tons of coal burned under each dollar's worth of brick. Credit it with a ten per-cent saving in fuel otherwise burned.

You will be agreeably surprised at the return you are getting on your expenditure for Security Arch Brick.

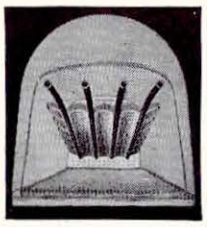




There's More to
SECURITY ARCHES
Than Just Brick

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists



AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

Railway Centenary of Canada and the two old locomotives of the Albion mines, in Nova Scotia, one of which was built by Timothy Hackworth, in 1838. There is a notice of the recent excursion of New York members of this society over the Delaware, Lackawanna & Western.

Modernization Program on Trans-Australian Railway

The Trans-Australian Railway has recently launched a modernization program which, when completed in July, 1937, is expected to expedite service so that travelers will save a day on the overland trans-continental journey between Perth and Melbourne. At the present time this trip is 2,169 miles and takes four days.

The principal feature of the modernization program is the construction of a new section of railway between Port Augusta and Red Hill, a distance of 84 miles, which will cut 70 miles from the through route; but more important still, it will eliminate the two breaks of gage which, the announcement states, "have for many years constituted the most unpleasant feature of trans-continental travel in Australia."

In addition to new construction, the program involves the air-conditioning of passenger cars and the acquisition of heavier motive power which will permit longer locomotive runs.

A.S.M.E. Annual Meeting

The fifty-seventh annual meeting of the American Society of Mechanical Engineers will be held in New York City November 30-December 5. High spots in the program, which will be of special interest to railroaders, include the presentation of the Hoover Medal at the dinner at the Hotel Astor on the evening of December 2 to Ambrose Swasey, for distinguished public service. A program commemorating the achievements of George Westinghouse, in the public interest, will be observed on Tuesday afternoon at four o'clock, and on the same evening at eight o'clock. At the afternoon session 15 or more men who were closely associated with Mr. Westinghouse and his work will present a symposium dealing with his achievements with the air brake, alternating current, the steam turbine, railroad electrification and industrial organization. At the evening meeting President James Rowland Angell, of Yale University, will speak on "Achievements of Westinghouse as Factors in Our Modern Life," and Paul D. Cravath will speak on "Westinghouse, the Man."

On Monday evening at eight o'clock, a Heating and Power Session will be held, at which the Steamotive will be considered. This is designed for application to a steam turbine electric locomotive of 5000 hp. requiring two such boiler units.

At two o'clock on Tuesday afternoon the Railroad Session will hold a meeting, at which time D. S. Barrows, of the Symington Company, will present a paper on the use of alloy steel for side frame and bolster tests. A progress report will also be made on railroad mechanical engineering.

A session on cutting metals will be held on Wednesday morning under the auspices of the Machine Shop Practice Division and the Research Committee on Cutting of Metals.

On Thursday, three sessions: morning, afternoon and evening will be held on corrosion resistant metals. Training people to be skilled workers will be discussed on Thursday afternoon. All of the technical meetings will be held in the Engineering Societies Building, New York City.

Transportation Association Meeting

A series of meetings of the Transportation Association of America, the object of which is the preservation of private ownership, initiative and operation in American industry, were held at Chicago on November 16 and 17. In addition to reaffirming its position against government operation or interference, the association took a position in opposition to moves towards a six-hour day by railroad labor unions.

Action was taken looking to the election of three administrative vice-presidents, as distinct from the corporate vice-presidents. Another resolution abolished the policy board and assigned its duties to the executive committee, while a third placed the management of the affairs of the association in the hands of a new management committee, consisting of the president, the chairman of the board, the executive vice-president, the vice-president in charge of research and education and the chairman of the executive committee.

The executive committee changed the schedule of dues, making the prescribed assessment for each class of sustaining membership a minimum instead of a maximum. The maximum for individual railroads was increased from $1,000 to $1,500 a year. The committee also decided to secure contributions, in addition to dues, for the purpose of establishing a fund for research work.

Officers and members of the executive committee elected are as follows: Chairman of the board, T. T. Harkrader, director of transportation of the American Tobacco Company; vice-chairman of the board, T. T. Huff, president of the American Serum Company; president, J. A. Gordon, director of the Farm Mortgage Conference; executive vice-president, Donald D. Conn; corporate vice-presidents, George R. Carr, vice-president of the Dearborn Chemical Company; Sydney Anderson, vice-president of General Mills, Inc., and George Stevenson, president of the Stevenson, Gregory Company; administrative vice-presidents, Mark M. Jones, in charge of research; George M. Cook, in charge of publicity, and Col. Eric Fisher Wood, in charge of education; secretary, Edith C. Krogh; treasurer, Perrin C. Miller, and assistant treasurer, George M. Cook.

A. N. Talbot Awarded 1937 John Fritz Gold Medal

Arthur Newell Talbot, professor emeritus of engineering at the University of Illinois, has been awarded the 1937 John Fritz Gold Medal, highest of American engineering honors. Prof. Talbot, who is 79, was cited as "moulder of men, eminent consultant on engineering projects, leader of research, and outstanding educator in civil engineering." The award is made annually for notable scientific or industrial achievement by a board composed of sixteen past-presidents of the four national societies of civil, mining and metallurgical, mechanical, and electrical engineers.

Prof. Talbot was born in Cortland, Ill., October 21, 1857. He received the degree of bachelor of science from the University of Illinois in 1881, and the degree of civil engineer in 1885. Honorary degrees were conferred on him by the University of Pennsylvania in 1915, the University of Michigan in 1916, and the University of Illinois in 1931. He has been engaged in engineering work since 1881, his activities embracing railroads, roads, bridges, buildings, and municipal public works. In 1885 he joined the Illinois faculty as assistant professor of engineering and mathematics. In 1890 he was appointed professor of municipal and sanitary engineering in charge of theoretical and applied mechanics. He became professor emeritus in 1926.

Prof. Talbot aided in the upbuilding of the University's testing laboratories and the College of Engineering. He has been active in the formation and development of the Illinois Engineering Experiment Station, in connection with which he has made numerous investigations in the properties of steel, brick, concrete and reinforced concrete, and in water purification, sewage treatment, and hydraulics. He has also directed studies sponsored by the American Society of Civil Engineers and the American Railway Engineering Association. For outstanding research in railroad track stresses he was awarded the plaque of the Association. He still continues his research at the University of Illinois.

Prof. Talbot has been president of the American Society of Civil Engineers, the Society for the Promotion of Engineering Education, and the American Society of Testing Materials, and is a member of many other professional organizations. He received the Washington Award in 1924, the Turner Medal in 1928, the Henderson Medal of the Franklin Institute in 1931, and the Lamme Medal of the Society for the Promotion of Engineering Education in 1932.

Supply Trade

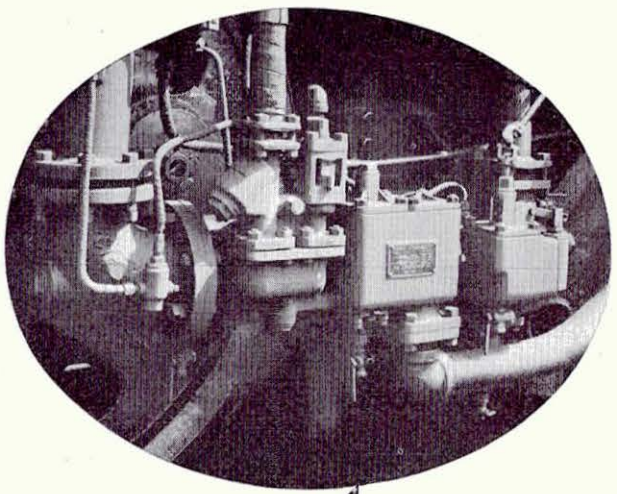
Roy C. Raasch has been appointed field representative for the **Copperweld Steel Company,** Glassport, Pa. Mr. Raasch's headquarters are at Chicago.

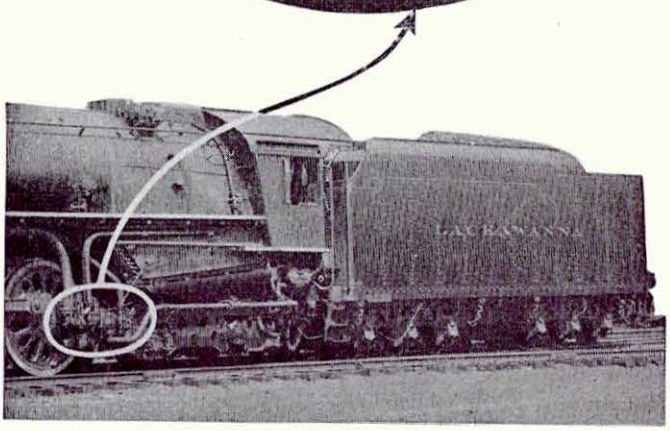
D. L. Eubank of Eubank & Turney, railway supplies, expects to continue under his own name as southern representative at Atlanta, Ga., for the manufacturing concerns formerly represented by Eubank & Turney. **Tom Turney** has withdrawn from this firm to go with the Mack International Truck Company as service engineer.

Continued on next left-hand page

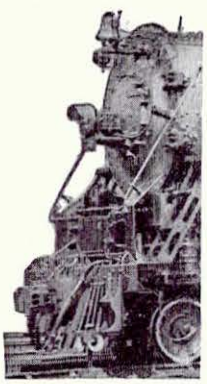
First came Injectors
—*then* exhaust steam *Injectors*

Railroads may now have an injector that uses exhaust steam to both preheat and inject the boiler feed water. This results in a fuel and water savings of 8%-12%, or a proportionate increase in steaming capacity.





More than 20,000 locomotives on railways throughout the world are equipped with this type of injector.



The Elesco exhaust steam injector is *dependable* and *economical.*

THE SUPERHEATER COMPANY

ELESCO

Representative of American Throttle Company, Inc.
60 East 42nd Street, New York
Peoples Gas Building, Chicago

Canada: The Superheater Company, Limited, Montreal

Superheaters . Superheated Steam Pyrometers . Tangential Steam Dryers Exhaust Steam Injectors . Feed Water Heaters . American Throttles

A-1101

Equipment and Supplies

LOCOMOTIVES

New York Central Orders 100 Steam Locomotives to Cost $8,600,000

The New York Central has ordered 100 steam locomotives to cost approximately $8,600,000 for delivery early next year. The order includes 50 Hudson type passenger locomotives, placed with the American Locomotive Company, and 50 eight-wheel switchers, placed with the Lima Locomotive Works.

The Bessemer & Lake Erie is inquiring for 10 Texas-type freight locomotives and 2 eight-wheel switchers.

The Union Railroad is inquiring for 4 Union-type ten-wheel switching locomotives.

The Chicago, Milwaukee, St. Paul & Pacific has ordered 30 locomotives of the 4-8-4 type from the Baldwin Locomotive Works, and one Hiawatha type locomotive from the American Locomotive Company, both orders being subject to the approval of the federal court and the Interstate Commerce Commission. Inquiry for this equipment was reported in the *Railway Age* of October 24.

FREIGHT CARS

Great Northern to Spend $6,000,000 for Equipment

Directors of the Great Northern have authorized the issuance of a $6,000,000 equipment trust issue for the purpose of purchasing 1,000 box cars, 500 coal cars, 500 ore cars and 12 coaches. The board also authorized the purchase of 20,000 tons of rails.

The Norfolk Southern is inquiring for 25 steel sheathed automobile cars of 40 tons' capacity.

The Chicago & North Western is inquiring for from 350 to 500 steel hopper cars of 70 tons' capacity.

The Elgin, Joliet & Eastern is inquiring for 750 drop-end gondola cars of 50 tons' capacity, 100 drop-end gondola cars of 70 tons' capacity and 200 center-dump hopper cars of 50 tons' capacity.

The Union Pacific has ordered 300 underframes from the Mount Vernon Car Manufacturing Company. Inquiry for this equipment was reported in the *Railway Age* of November 7.

The Lone Star Cement Company has ordered 10 bucket cars of 40 tons' capacity from the Pullman-Standard Car Manufacturing Company. These cars are to be used for hauling rock in Brazil.

The Gulf, Mobile & Northern has ordered 300 steel frame, single-sheathed wood-lined box cars of 50 tons' capacity from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of October 10.

The Western Maryland, reported in the *Railway Age* of November 7 as inquiring for 500 box cars and 100 gondola cars, all of 50 tons' capacity, has ordered this equipment from the Bethlehem Steel Company.

The Chicago, Rock Island & Pacific has ordered 350 steel sheathed automobile cars 40 ft. 6 in. long and of 50 tons' capacity, from the American Car & Foundry Company, subject to the approval of the court. Inquiry for this equipment was reported in the *Railway Age* of October 17.

PASSENGER CARS

The Union Pacific has ordered 40 coaches, 5 dining cars and 5 kitchen-dormitory cars from the Pullman Standard Car Manufacturing Company.

The Chicago, Rock Island & Pacific has ordered six streamlined trains from the Edward G. Budd Manufacturing Company and Diesel-electric power plants for the locomotives from the Electro Motive Corporation, subject to the approval of the court. Inquiry for this equipment was reported in the *Railway Age* of October 10.

IRON AND STEEL

The Long Island has ordered 6,000 tons of new, heavy section steel rail.

The Saint Louis Southwestern has ordered 500 tons of rail from the Tennessee Coal, Iron & Railroad Company.

The New York Central has ordered 82,150 tons of steel rail which, with track accessories and splice bars, will cost $5,500,000.

The Illinois Central has ordered 10,000 tons of rails, placing 2,500 tons with the Inland Steel Company, 2,500 tons with the Carnegie-Illinois Steel Company and 5,000 tons with the Tennessee Coal, Iron & Railroad Company.

Atlanta & West Point-Western Railway of Alabama.—An order for about 957 tons of 100-lb. RE rail was placed in October for delivery to the Western Railway of Alabama at Opelika, Ala. This is in addition to a previous order for about 240 tons which was placed in July.

MOTOR VEHICLES

The Pacific Electric has received delivery of ten 25-passenger motor coaches from the Twin Coach Company.

MISCELLANEOUS

Wabash.—This company has been authorized by the federal district court at St. Louis, Mo., to spend $165,412 for various improvements, including the replacement of rails, the construction of water tanks, the purchase of track maintenance equipment and the purchase and relocation of maintenance of way shop machinery.

Financial

Chesapeake & Ohio.—*Preference Stock.* This company has applied to the Interstate Commerce Commission for authority to issue $15,315,500 of 4 per cent noncumulative preference stock to be distributed to its common stockholders as a stock dividend.

Chicago & Eastern Illinois.—*Counsel's Fees.* The Interstate Commerce Commission has authorized payment of $15,000 to Ernest S. Ballard, special counsel, for services up to June 30 last in addition to an interim allowance of half that sum for services performed in the previous year; without prejudice as to fixing a higher allowance later. Mr. Ballard sought compensation of $32,500 for his services up to June 30 last.

Chicago & North Western.—*Abandonment and Joint Operation.* The Interstate Commerce Commission has authorized this company to operate over the Soo Line between Marshfield, Wis., and Arpin, 11 miles and to abandon its own line between those points; and for the Soo Line to operate over the North Western between Arpin and Wisconsin Rapids, abandoning its line between those points; the two roads being also authorized to construct the necessary connecting tracks.

Chicago, Kalamazoo & Saginaw.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line between Berry, Mich., and Stanfield, 26.7 miles.

Chicago, Milwaukee, St. Paul & Pacific.—*Equipment Trust Certificates.*—The trustees have applied to the Interstate Commerce Commission for authority for an issue of $3,180,000 of 3½ per cent equipment trust certificates.

Illinois Central.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a loan of $10,000,000 to be available May 31, 1937, to aid in meeting the maturity of $12,500,000 three-year 6 per cent notes. At the same time various subsidiaries of the Illinois Central applied to the Interstate Commerce Commission for authority to issue and deliver to the Illinois Central 4 per cent demand notes totaling $26,440,000 representing advances, which are to be pledged as collateral for the loan.

Kansas City, Kaw Valley & Western.—*Reorganization Plan.*—The Bureau of Finance of the Interstate Commerce Commission has submitted a proposed report recommending that the commission approve a plan of reorganization proposed by the debtor, with some modifications.

Minneapolis, St. Paul & Sault Ste. Marie.—*See Chicago & North Western.*

Morgan & Fentress.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon as to interstate and foreign commerce its

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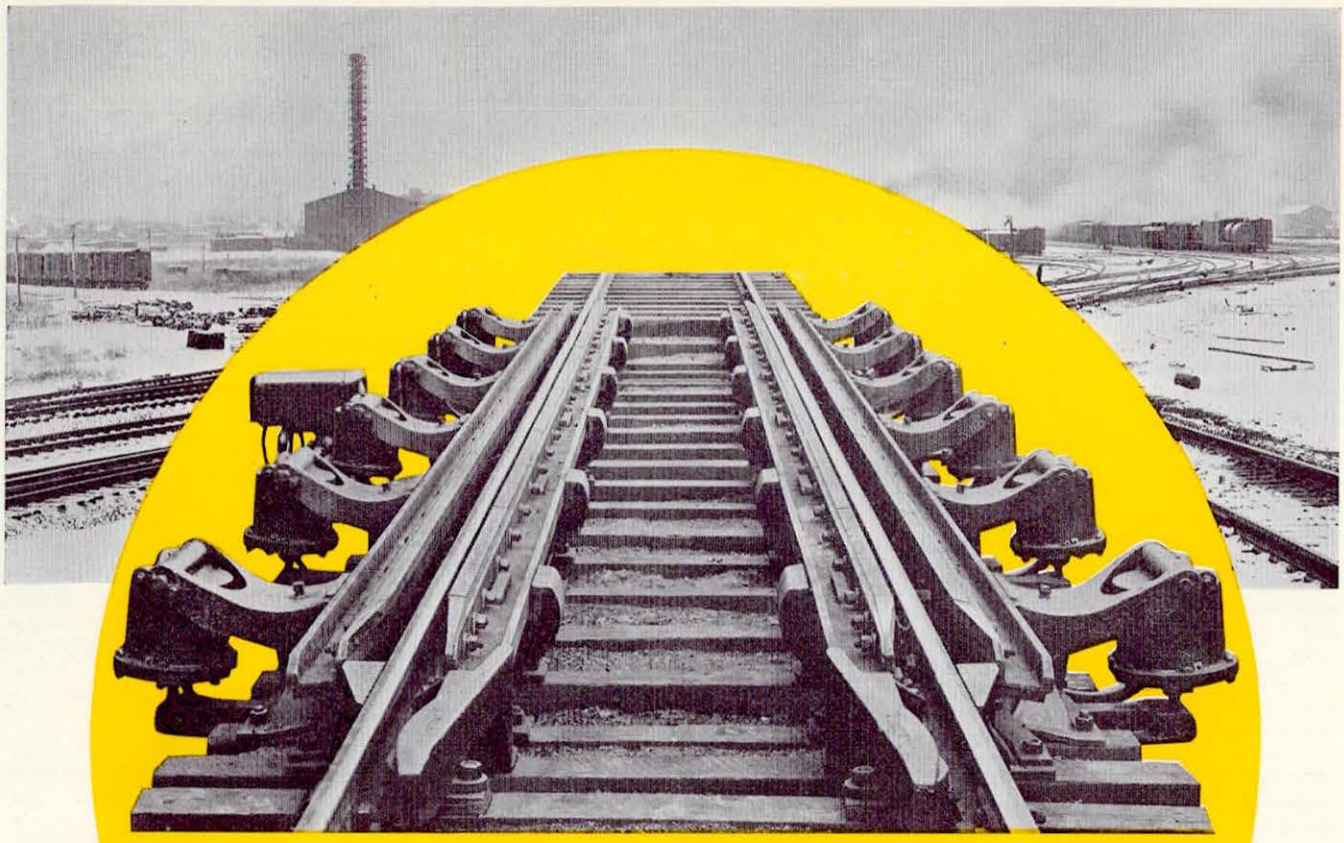

"LOOK TO ECONOMIES TO BE FOUND IN YARD AND TERMINAL OPERATIONS

to offset the rising ton mile cost in road train movements".....★

In 1933 the Signal Section A. A. R., conducted a survey of car retarder installations which indicated: » » » » » » » » » » » » » » » »

1. An average annual return on the total capital investment of 42.86 per cent.
2. An average saving per car handled of 28 cents.
3. Elimination of switching at other points with additional savings.
4. That with the small amount of only 768 cars handled in 24 hours, the savings were 37.83 per cent.

The combination of present increased traffic and improvements incorporated in the "Union" Electro-Pneumatic Car Retarder, makes possible greater economies.

★ *Railway Age, September 26, 1936, p. 445.*

1168

1881 **Union Switch & Signal Co.** 1936

SWISSVALE, PA.

NEW YORK MONTREAL CHICAGO ST. LOUIS SAN FRANCISCO

entire 23-mile line between Nemo, Tenn., and Obed.

NEW YORK, CHICAGO & ST. LOUIS.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to extend for ten years the maturity date of $7,250,000 of first mortgage bonds issued by the Lake Erie & Western, maturing January 1, 1937, and to reduce the interest rate from 5 to 3¼ per cent.

NEW YORK, NEW HAVEN & HARTFORD.—*Trustees Ratified for Old Colony.*—Division 4 of the Interstate Commerce Commission has ratified the appointment of Howard S. Palmer, W. M. Daniels, and James Lee Loomis, trustees of the New Haven, as trustees also of the Old Colony. Certain interests had urged the appointment of an independent trustee but the commissioners said in the report that no objection to the ratification of these appointments had been made except that they were also trustees of the New Haven and that:

"We are not persuaded by the arguments of counsel that an independent trustee, with title to the property, is necessary to ensure adequate protection for the interests of the Old Colony pending reorganization. It is our view that the making of studies and investigations to determine the fair division of earnings during the period of administration, and the proper distribution of new securities in reorganization, does not, in contemplation of section 77, require legal title to the property. Subsection 77(c) (12) makes adequate provision for the expenses incurred for such purposes, in connection with the proceedings and plan, by subsidiary debtors and representative committees. We do not share the concern of counsel that substantial interests of the Old Colony are in danger of being neglected under such circumstances. On the other hand, a unified administration of the two estates under the same trustees should reduce expenses, and should, in our opinion, promote efficient operations pending reorganization."

PITTSBURGH & WEST VIRGINIA.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume liability for $350,000 of 2½ per cent equipment trust certificates, maturing 1937-46, to be sold to Stroud & Co., Philadelphia, at 98.08, making the annual cost of the money 2.92 per cent.

QUAKERTOWN & BETHLEHEM.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its line, from Quakertown to Durham, Pa., 13 miles, giving as the reason, "Insufficient revenue."

TENNESSEE CENTRAL.—*R. F. C. Loan.*—This company has applied to the Reconstruction Finance Corporation for a ten-year loan of $5,000,000, to be used to call $3,410,000 of first mortgage 6 per cent bonds due April 1, 1947, at 105; to pay a note of $147,700 to the R. F. C. due September 1, 1937, to purchase at 90 $1,000,000 par value of Nashville Terminal 6 per cent bonds; to pay $100,000 of bank notes, and $62,939 of notes to the Railroad Credit Corporation.

Average Prices of Stocks and of Bonds

	Nov. 24	Last week	Last year
Average price of 20 representative railway stocks..	55.84	57.83	39.80
Average price of 20 representative railway bonds..	82.83	83.68	74.10

Dividends Declared

Atlantic Coast Line.—$1.00 (resumed), payable December 23 to holders of record November 30.

Delaware & Bound Brook.—$2.00, quarterly, payable November 20 to holders of record November 17.

Kansas, Oklahoma & Gulf.—6 Per Cent Preferred A, $3.00; 6 Per Cent Non-cumulative Preferred B and C, $3.00, both payable December 1 to holders of record November 25.

Louisville & Nashville.—Extra, 1½ per cent, payable December 23 to holders of record November 30.

Mobile & Birmingham.—4 Per Cent Guaranteed, $2.00, semi-annually, payable January 2 to holders of record December 1.

Norfolk & Western.—Extra, $5.00, payable December 10.

Texas & Pacific.—Non-cumulative 5 Per Cent Preferred, $2.50, payable December 15 to holders of record November 30.

Construction

CHICAGO, ROCK ISLAND & PACIFIC.—This company has placed an order with the Ross & White Company, Chicago, for new cast iron cinder hoppers and other equipment for addition to its existing N & W type electric cinder handling plant at East Des Moines, Iowa.

DELAWARE, LACKAWANNA & WESTERN.—A low bid of $123,494 submitted by the Potter-DeWitt Corporation, Pavilion, N. Y., for the elimination of this road's grade crossing on the Pavilion-Canawaugus highway in the town of Pavilion, has been approved by the New York Public Service Commission. The commission directed the railroad to award the contract and begin the elimination work. See *Railway Age*, September 26, page 465.

THE LONG ISLAND.—The New York Public Service Commission has ordered the elimination of four grade crossings in Floral Park, N. Y.

NEW YORK STATE GRADE CROSSING ELIMINATIONS.—The New York Public Service Commission has approved a list of railroad grade crossings which are to be considered for elimination during the year 1937. The list includes 24 projects to be eliminated at an estimated cost of $18,714,000; of these 15 projects were carried over from the 1936 program and nine are new projects. The estimated cost of eliminating the projects carried over from 1936 is $18,370,000 and of the new projects is $344,000. Several of the projects on the list involve the proposed elimination of more than one crossing.

VIRGINIAN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of an extension from Morri, W. Va., to Simon, 23.4 miles, and another from the mouth of Laurel Fork 6.7 miles up Clear Fork and Tiney Fork.

Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

At a meeting of the board of directors of the Richmond, Fredericksburg & Potomac in New York City on November 19, **Douglas Call,** assistant treasurer of the company, was elected treasurer, with headquarters at Richmond, Va., succeeding **D. K. Kellogg,** deceased. The position of assistant treasurer has been abolished.

Henry R. Holmgren, general auditor of the Pullman Company, has been promoted to comptroller, effective November 1, to succeed **E. C. Morris,** deceased. **A. F. Brevillier,** assistant comptroller, has been appointed general auditor, effective the same date, to succeed Mr. Holmgren. Mr. Brevillier and Mr. Holmgren will continue to have their offices at Chicago.

Mr. Holmgren has been identified with

Henry R. Holmgren

the Pullman Company for 46 years. He was born on October 29, 1877, at Chicago and first entered the service of this company on July 12, 1890, as an office boy in the earnings department. After holding various clerical positions he was transferred to the general auditor's office on October 16, 1905, where he was advanced to chief clerk on January 1, 1913. Four years later he was appointed auditor of disbursements and in 1921 he was further advanced to assistant general auditor. In 1929 Mr. Holmgren became general auditor, the position he was holding at the time of his recent appointment as comptroller.

Mr. Brevillier was born on February 24, 1885, at Erie, Pa., and obtained his early business experience in that city with the Pittsburg & Erie Coal Company and the W. L. Scott Coal Company as a stenographer and clerk. On April 1, 1908, he entered the service of the Bureau of Accounts of the Interstate Commerce Commission as a clerk, later serving as examiner of accounts and field leader. On July 1, 1910, he was transferred to the Chicago office of the Bureau of Accounts.

On October 20, 1926, Mr. Brevillier entered the service of the Pullman Company as assistant to the vice-president and

A. F. Brevillier

comptroller, later being assigned the title of assistant to vice-president. He had been assistant comptroller since March 1, 1936.

OPERATING

A. G. Kasson has been appointed trainmaster on the New York, Chicago & St. Louis, with headquarters at Delphos, Ohio, succeeding **R. D. Maloney,** promoted.

J. A. Stanley has been appointed assistant superintendent of the Montreal Terminals division of the Canadian Pacific, with headquarters at Montreal, Que., succeeding **A. R. McLeod,** transferred.

W. F. Booth, who has been appointed superintendent of the St. Louis division of the Baltimore & Ohio, with headquarters at Washington, Ind., as reported in the *Railway Age* of November 7, was born on March 9, 1880, at Mauch Chunk, Pa. Mr. Booth entered railway service in November, 1895, on the Lehigh division of the Lehigh Valley, being advanced to yardmaster in April, 1899. In July, 1904, he was made superintendent of the Chestnut

W. F. Booth

Ridge, returning to the Lehigh Valley as yardmaster in August, 1905. Two years later Mr. Booth went with the Central Railroad of New Jersey as a yardmaster, and in October, 1911, he was appointed to the same capacity on the Monongah division of the Baltimore & Ohio, returning to the Central of New Jersey in the same capacity in December, 1911. In January, 1912, he again became yardmaster of the Monongah division of the B. & O., being advanced to general yardmaster on this division in March of the same year. In August, 1913, Mr. Booth was appointed assistant trainmaster of the Chicago division and in November, 1914, he was assigned to the position of terminal trainmaster of the same division. From March, 1917, to August, 1920, he served as superintendent of the Chicago Short Line, then becoming traffic superintendent of the Semet Solvay Company. In November, 1921, Mr. Booth returned to the B. & O., as general yardmaster of the Wheeling division, being appointed terminal trainmaster on the Monongah division in April, 1922. In June of the same year he was advanced to assistant superintendent on the Pittsburgh division, and in April, 1923, he was transferred to the Akron division. Two months later he was appointed terminal superintendent on the Pittsburgh division, being appointed assistant superintendent on the same division in February, 1932. He was holding the latter position at the time of his recent appointment as superintendent of the St. Louis division.

J. J. Gallagher, district engineer on the Missouri-Kansas-Texas of Texas, with headquarters at Denison, Tex., who has

J. J. Gallagher

been promoted to superintendent of the North Texas district, with the same headquarters, as reported in the *Railway Age* of November 21, was born at Lamar, Mo., and studied at the University of Missouri. Following his graduation from college in 1919, he entered the service of the M-K-T as an instrumentman in the engineering department at Parsons, Kan. Later in the same year, Mr. Gallagher was advanced to assistant engineer at Parsons, and in May, 1920, he was transferred to Muskogee, Okla. In April, 1921, he was made assistant roadmaster at Wichita Falls, Tex., and five months thereafter he was advanced to roadmaster at Denison. When the latter position was abolished in February, 1922, Mr. Gallagher was appointed general foreman, holding this position until October 1, 1924, when he was made a roadmaster on the South Texas district. Two years later he was transferred to the St. Louis district and from July 1, 1928, to January 1, 1929, he served as general foreman in charge of maintenance and construction. At the end of this period he was appointed district engineer of the South Texas district and on October 1, 1929, the North Texas district was added to his jurisdiction. His promotion to superintendent of the North Texas district became effective on October 15.

TRAFFIC

E. M. Mattes has been appointed general agent, passenger department, of the Union Pacific, with headquarters at Kansas City, Mo., to succeed **S. C. Rhodes,** who has retired.

J. E. Dimond, a clerk in the general freight office of the Missouri Pacific Lines at St. Louis, Mo., has been promoted to assistant general freight agent, with the same headquarters, effective November 16.

MECHANICAL

T. Olson has been appointed master mechanic on the Chicago Great Western, with headquarters at Oelwein, Iowa, succeeding **J. S. Morris,** who has been assigned to other duties.

F. J. Jumper, assistant general mechanical engineer of the Union Pacific, has been appointed acting general mechanical engineer, with headquarters as before at Omaha, Neb., succeeding **A. H. Fetters,** who has retired.

W. Donohue, master mechanic on the Southern Pacific Lines in Texas and Louisiana, with headquarters at Ennis, Tex., has been appointed superintendent of shops, with headquarters at Algiers, La. **J. S. Netherwood,** assistant superintendent motive power and equipment at Algiers, has been transferred to Houston, Tex., and the position of assistant superintendent motive power and equipment at Algiers as well as that of chief assistant superintendent motive power and equipment at Houston, Tex., which has been held by **B. M. Brown,** have been abolished. **J. E. Frels,** roundhouse foreman at Yoakum, Tex., has been promoted to master mechanic at Ennis, to replace Mr. Donohue. **F. L. Carson,** master mechanic of the San Antonio division, with headquarters at San Antonio, Tex., has had his jurisdiction extended to include the Victoria division.

OBITUARY

George Ziegler, superintendent of transportation of the Railway Express Agency, Inc., with headquarters at Chicago, died on November 17 at his home at that point, at the age of 57 years.

Timothy A. O'Toole, passenger trainmaster of the New York division of the Pennsylvania, with headquarters at Jersey City, N. J., died on November 23 in the Elizabeth (N. J.) General Hospital of pneumonia. He was 43 years old.

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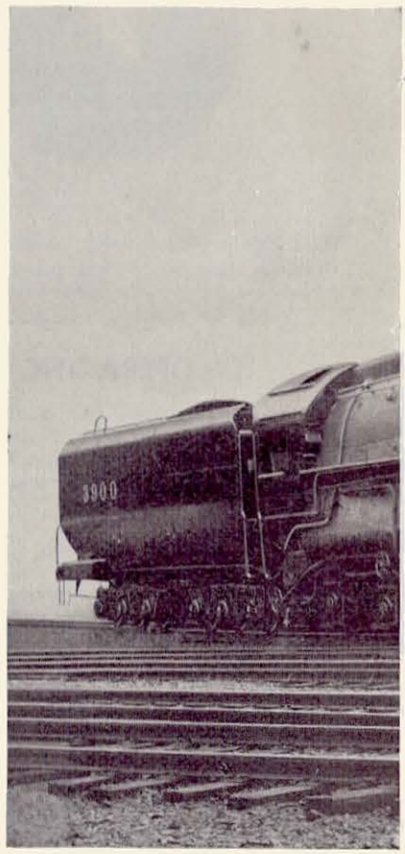

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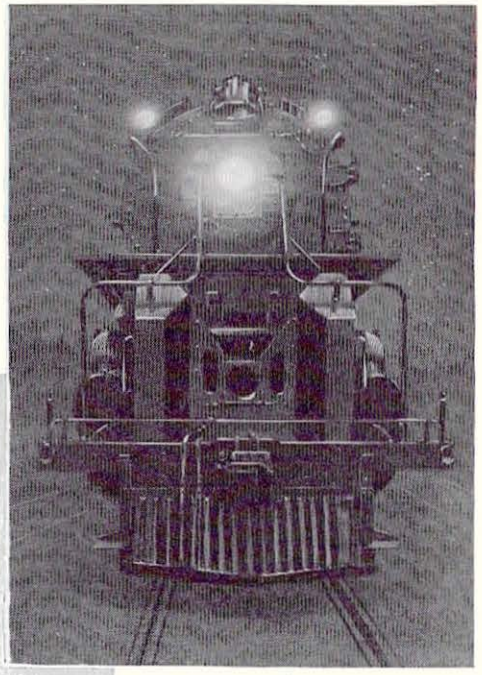

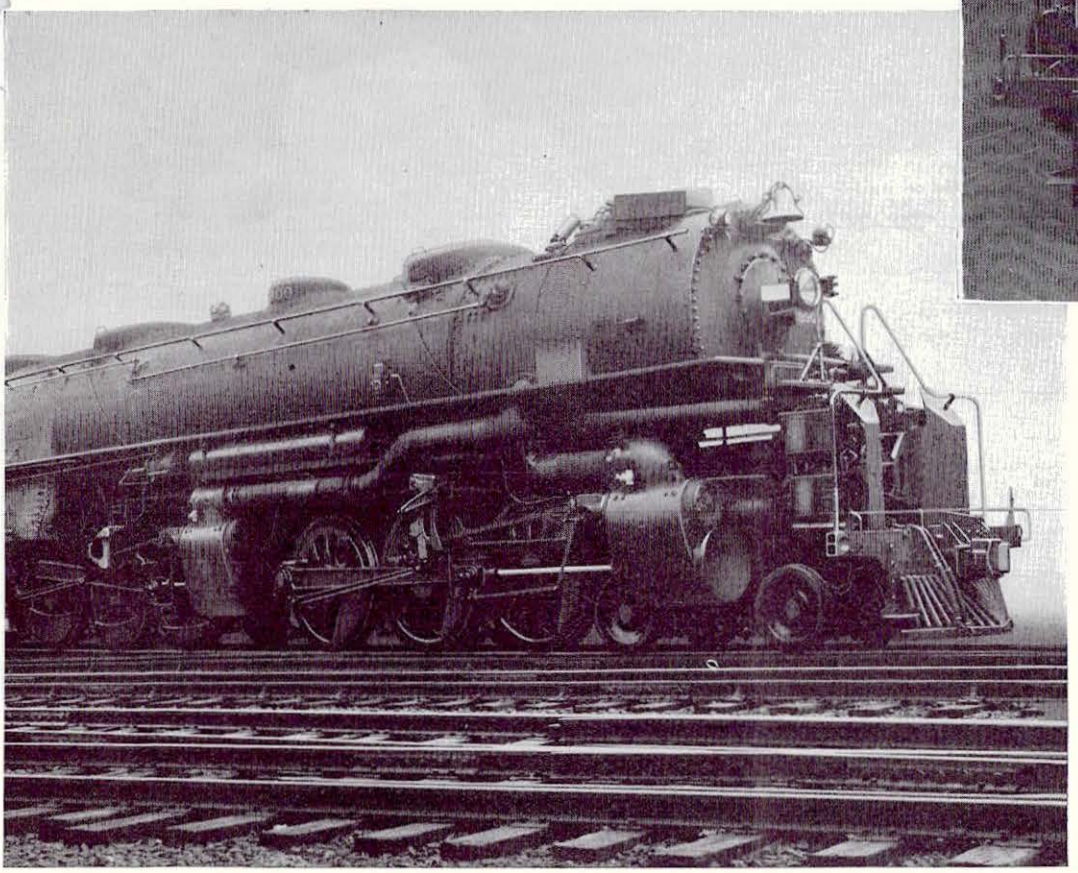

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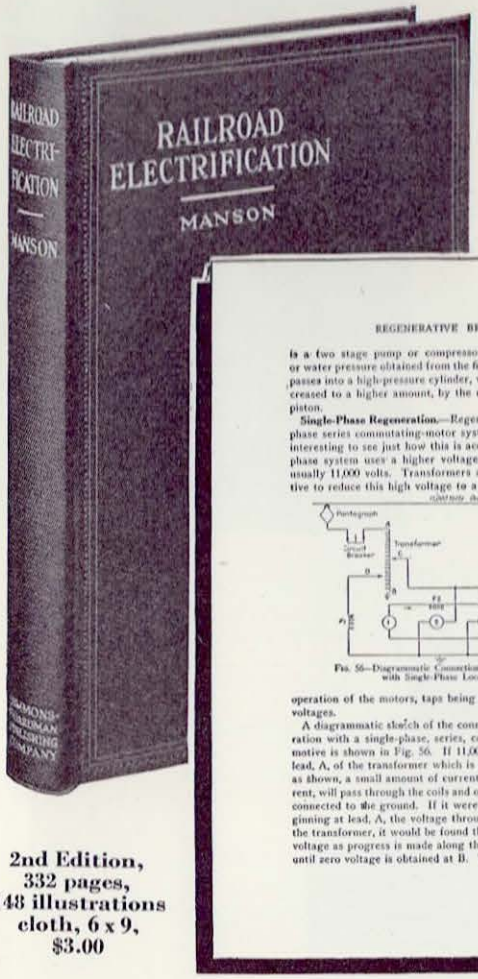
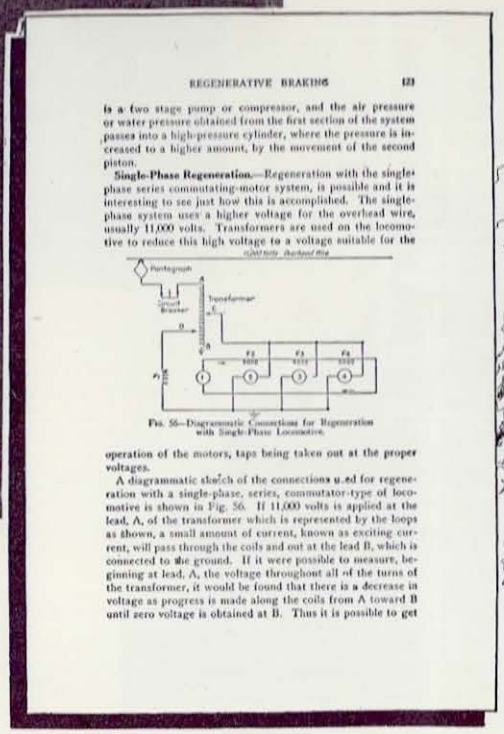


By Arthur J. Manson

Assistant Sales Manager, Transportation Department, Westinghouse Electric & Manufacturing Company



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is a two stage pump or compressor, and the air pressure or water pressure obtained from the first section of the system passes into a high-pressure cylinder, where the pressure is increased to a higher amount, by the movement of the second piston.

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FIG. 56—Diagrammatic Connections for Regeneration with Single-Phase Locomotive

operation of the motors, taps being taken out at the proper voltages.

A diagrammatic sketch of the connections used for regeneration with a single-phase, series, commutator-type of locomotive is shown in Fig. 56. If 11,000 volts is applied at the lead, A, of the transformer which is represented by the loops as shown, a small amount of current, known as exciting current, will pass through the coils and out at the lead B, which is connected to the ground. If it were possible to measure, beginning at lead, A, the voltage throughout all of the turns of the transformer, it would be found that there is a decrease in voltage as progress is made along the coils from A toward B until zero voltage is obtained at B. Thus it is possible to get

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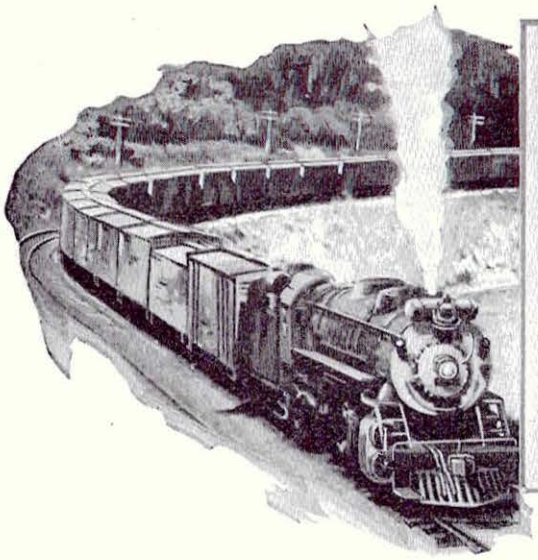

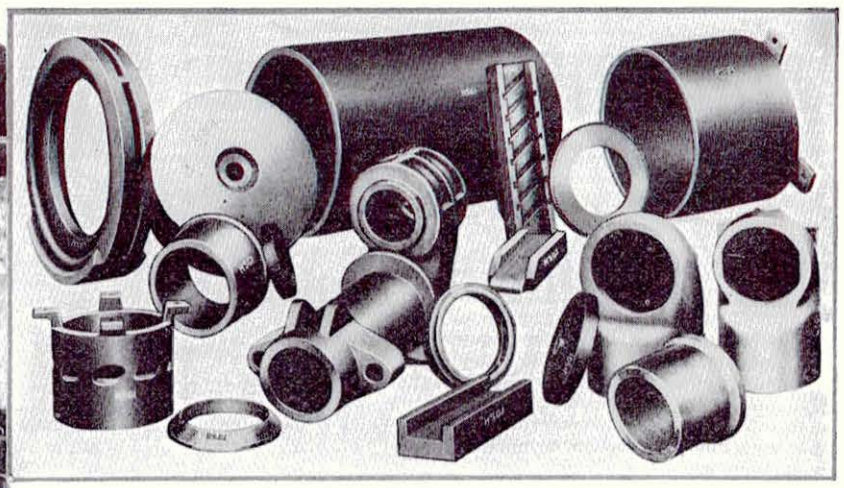

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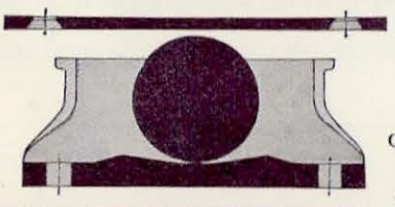

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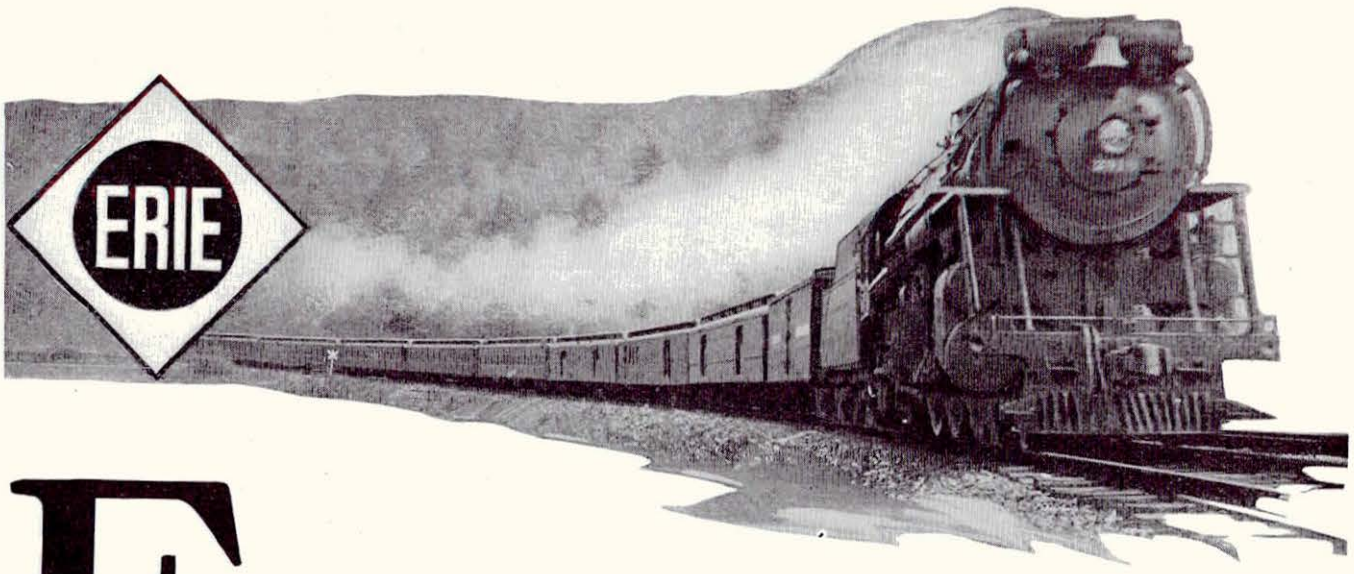

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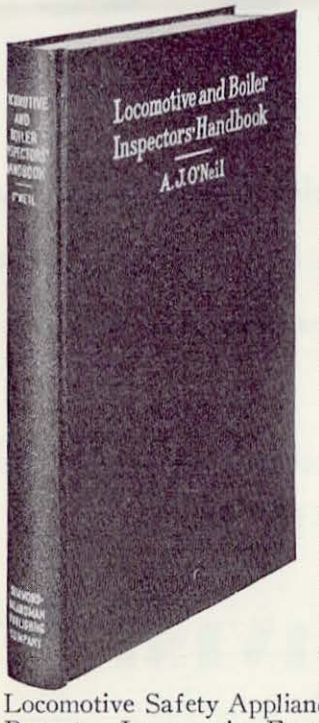

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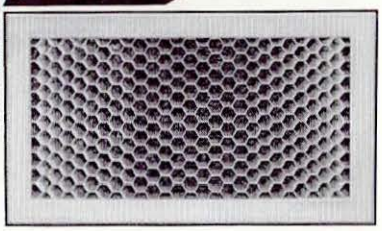

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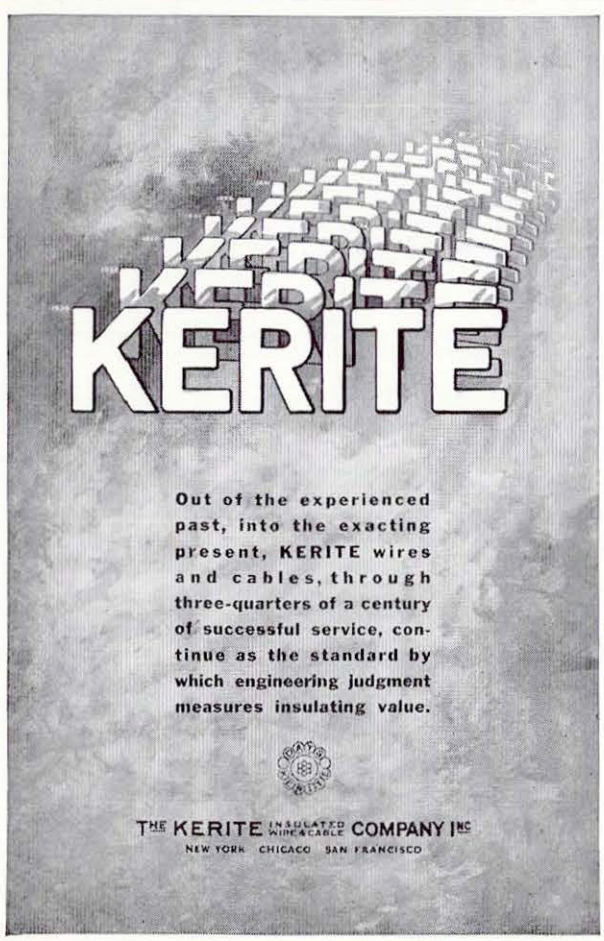
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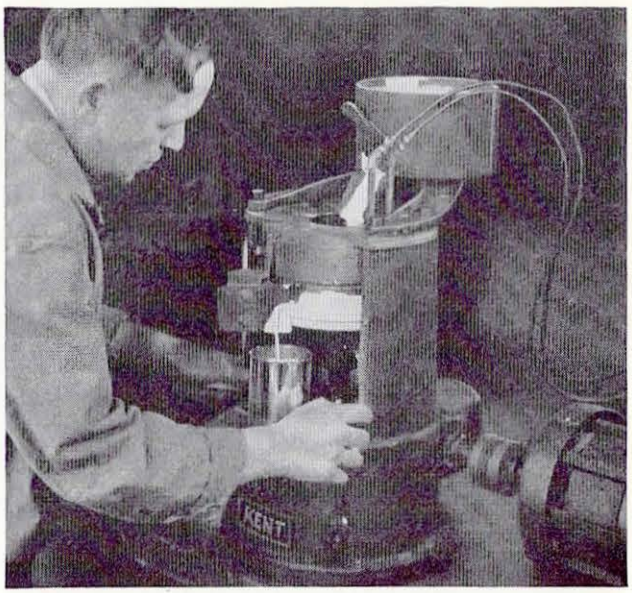

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In protective coatings, Bakelite Synthetic Resins show a marked ability to heighten the degree of all these factors! Even where they are used as a minor percentage of the total resin content, they appreciably *fortify* the service value of the coating.

Today, Bakelite Resins are being used to an increasing extent to fortify commercial paints, varnishes and enamels. Leading manufacturers of railroad finishes have adopted them to improve the formulation of metal paints and primers, aluminum paints, building finishes, car varnishes and enamels, and practically all types of coatings used in railroad operation.

We urge you to learn more about these modern high-integrity coatings. Ask your paint supplier and write for our informative booklet 24S, "Bakelite Resins for Paints and Varnishes."

BAKELITE CORPORATION, 247 Park Avenue, New York
BAKELITE CORPORATION OF CANADA, LTD., 163 Dufferin Street, Toronto

BAKELITE

The registered trade marks shown above distinguish materials manufactured by Bakelite Corporation. Under the symbol "B" is the numerical age for infinity, or unlimited quantity. It symbolizes the infinite number of present and future uses of Bakelite Corporation's products.

SYNTHETIC RESINS

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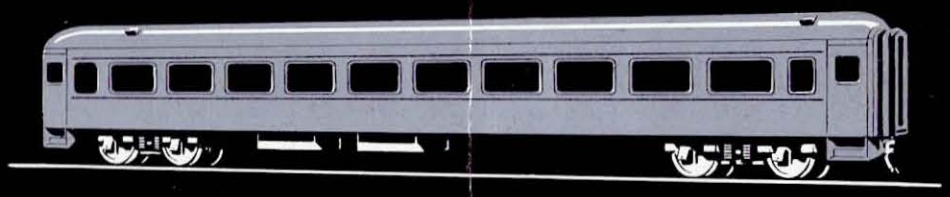


CHANGE MAINTENANCE INTO INVESTMENT

WITH LIGHTNESS, BEAUTY, RESISTANCE TO CORROSION

Reconditioning can be just maintenance expense.

Or it can be an investment which will pay a definite return on every dollar spent, by reducing later maintenance charges.

Extensive use of Alcoa Aluminum puts reconditioning in the investment category. Resistance to corrosion caused by sulphur and moisture is an inherent quality of Aluminum; it gives assurance of a longer lasting job, and also reduces need for maintenance of finish. This applies to roof and doors, and other spots where corrosive attack is most severe. On the interior the sparkling, modern beauty of Aluminum is a lasting advertisement of modern, comfortable service.

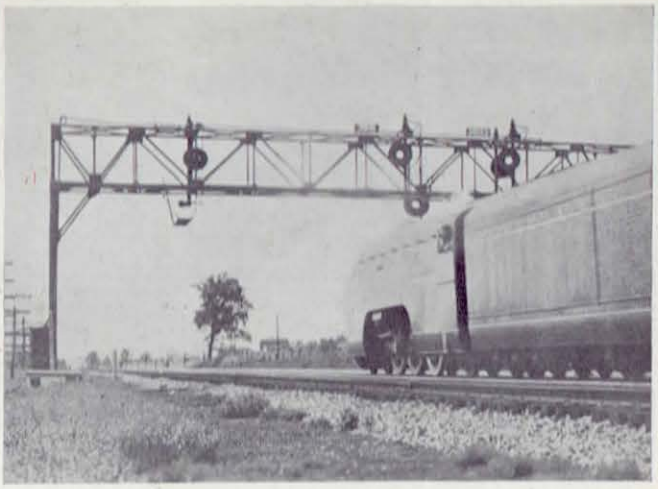
Lightness is another story, and it is needless to emphasize how lighter rolling-stock returns day by day savings. Replacement of a roof with Alcoa Aluminum can save a ton of weight. For air-conditioning, the use of Aluminum, plus Aluminum foil insulation, saves weight equivalent to the weight of the extra equipment.

The savings from lightness and resistance to corrosion, and the modern beauty of Aluminum construction, have established Alcoa Aluminum in the reconditioning programs of many roads. Ask about it. ALUMINUM COMPANY OF AMERICA, 2178 Gulf Building, Pittsburgh, Pennsylvania.

ALCOA

ALCOA ALUMINUM

ALUMINUM



BUDGET FOR SIGNAL IMPROVEMENTS IN 1937

In preparing the 1937 signal budget, consideration should be given to the following which not only greatly increase the safety of train operation but also facilitate train service and reduce operating expenses.

Automatic block signaling.

Cab signaling.

Centralized traffic control.

Consolidation of interlockings.

Highway grade crossing protection.

Power equipment to replace mechanical plants.

Remotely controlled switches.

Units for existing signals to provide additional aspects for high speed operation.

An expenditure by your road for modern signal apparatus either to replace obsolete equipment or to add to present equipment, will pay dividends, not only in increased efficiency of operation, but also in an actual monetary return on the investment.

UNION SWITCH & SIGNAL COMPANY
Swissvale, Pennsylvania

GENERAL RAILWAY SIGNAL COMPANY
Rochester, N. Y.

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HISTORY IN THE MAKING

The average speed of freight trains between terminals, including all delays encountered enroute, is now approximately 55 per cent higher than it was in 1920.